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AMAZING STORIES

Science Fiction

Vol. 8

February, 1934

No. 10

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Our Cover

depicts a scene from the story entitled "Triplanetary,"
by Dr. E. E. Smith ; drawn by Morey.

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AMAZING STORIES

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VOLUME
8

February, 1934
No. 10

T. O'CONOR SLOANE, Ph.D., *Editor*
Editorial and General Offices: 222 West 39th Street, New York, N. Y.

Extravagant Fiction Today Cold Fact Tomorrow

Lumens

By T. O'CONOR SLOANE, Ph.D.

ELCTRICKITY has been defined, inadequately of course, as a science of measurement. Taking physics in general, it is largely susceptible of the same definition, because measurements are constantly being made in it. We have referred recently to the little inscription, almost illegible, that is placed on the tops of the majority of lamp bulbs, giving the voltage which they will operate under and the watts which are passed by them when in full action. The watt is a unit of energy and a mechanical horsepower is equal to 746 watts, so the rather abstract conception of a watt is quickly brought to foot-pounds that is to pounds of weight raised to a specified height expressed in feet. A pound raised 100 feet is a measurement of 100 foot-pounds and so on for all weights and heights. Fol-

lowing out what we have said, it will be evident that about 15 fifty watt lamps would require nearly a horsepower of energy to operate. Now the object of a lamp is to produce light. If you touch one that is giving light, or immerse one in a tumbler of water, turning on the current after immersion, you will find that it produces heat also and the heat is distinctly a waste product, doing no good whatever. So, in everyday use what we have to measure in a lamp is its candle power, the number of candles which would give the same amount of light.

In the old days of gas lighting, the candle power of gas varying greatly, sometimes being twice as high in illuminating value as another product might be, the light which it gave was perpetually being measured and what was

called the science of photometry or of light measuring was developed. The apparatus for measuring the illuminating power of gas was called a photometer and the process was called photometry.

Photometry on which contracts for the supply of millions of cubic feet of gas were and are based is extremely crude. The unit of measurement was the candle and it is quite surprising how by adequate care and experience reasonably accurate results could be obtained.

The standard candle was what is known as the sperm candle, so when the last sperm whale is killed, photometry will have lost its standard. This was to be of a size of body and of wick that would burn two grains of sperm every minute and it came pretty close to doing this, the weight consumed, being determined for every observation. A candle power is the light emitted in a horizontal direction by a standard candle. If a source of light, of unknown amount, were placed on a level with and three or four feet from a standard candle, and a piece of paper were held between the two, so that both sides of it would be evenly illuminated, the candle power of the light being tested would vary with the square of its distance from the candle. If the sheet of paper that we supposed we were using, were equally illuminated on both sides and were twice as far from the light being tested as it was from the candle, then the light would be four times as strong as the standard or would be giving four candle powers of light.

It is curious how engineers and scientists accepted this candle power as a unit of measurement. The same candle would give more light in one direction than in another, because of the curvature of the wick. If it did not burn the precise two grains per minute, this also introduced an error which was compensated for by a correction whose

arithmetic was all right but which was certainly far from an accurate correction in the sense of light given. Warm weather by its effect on the candle, increases the inaccuracy, so that sometimes the observer would cool the candle by the use of ice immediately before taking the observation. As the observation lasted only five minutes or ten minutes, the candles kept considerable of the chill, so as to enable them to burn correctly.

A candle power of light is the illumination given from the side of a candle flame of standard characteristics. It is always used, has never been abandoned as a unit, and the development of the electric light has given it a much more definite status than it originally possessed.

We refer to the piece of paper which we used as an illustration of the definite quantities of light. The great chemist and physicist in Heidelberg, Robert Bunsen, devised the Bunsen disc. This was a piece of pasteboard in whose center was a circular area saturated with wax. This made it slightly transparent. If it were held between the eye and a light, the wax saturated area would appear brighter than the rest of the paper. If this were held between a standard candle and a light being tested, and if it received the same amount of light from both sources, each side would appear exactly the same as the other or nearly so. The original idea undoubtedly was that the "grease spot" as it used to be called, would disappear but it was not obliging enough to do this, so the best the observer could do was to place it in such a position that both sides appeared exactly the same. Crude as it seems, the old photometer in the hands of a practised observer gave surprisingly consistent results. The method has been greatly refined, the apparatus has been made far more accurate, and details of manipulation have been introduced, which

elevate photometry considerably from the old level. So when we hear the expression of candle power, in what has been said, we know what it means. When we are told that the old carbon filament lamp required about four watts to produce a candle power of light, when we recollect that 746 watts represent a horsepower, the expression four watts to a candle power has a very concrete and practical meaning. One horsepower is required with carbon lamps to produce a little less than 187 candles of light.

When the tungsten filament lamp of a few years ago came into being, there was an immense advance made in the economy of lighting. It was about four times as economical as the carbon filament lamp. About one watt would give a candle power, so that a horsepower now gives us in the neighborhood of 700 to 750 candles of light. But even now we are sadly distant from the extent of development which the incandescent lamp may yet attain.

In olden times men would read by the light of a single candle. One of Hogarth's caricatures shows a man wearing a hat with a broad brim and quietly reading a document, while the candle is burning a hole in his hat. Dr. Johnson, reading by candle-light, his eyesight being very defective, used to turn the candles over to make them blaze up better, and distributed spots of grease all over the carpet, greatly distressing his hostess' instincts as a housekeeper. This is told of the wife of his biographer, Boswell.

Now we have graduated from the candle by many steps, and, leaving the relatively weak carbon filament lamp behind us, we want for our private rooms a forty or fifty candle power incandescent lamp.

Different methods of illumination with lamps in a room have been devised. One

of the ways involves screening the lamps from sight and lighting the room by the rays reflected from the walls and ceiling. A very simple and effective way of doing this is to have the lamp on a standard surrounded by an open cone of opaque material, the apex down, and letting the light be cast upon the ceiling so as to be reflected from it. A lamp of a hundred watts or more, perhaps even four or five hundred watts, will give wonderfully beautiful results, and our readers have often seen this system applied. But suppose it was only a 100 watt lamp. In the old times it would have taken 100 candles to give the light of this one little lamp, and, instead of the graceful standard surrounded by the cone, it would have taken something like a coal stove to have held the many candles.

It is evident that "candle power," which means simply the light given by a candle in a horizontal direction, is simplicity itself as far as understanding it goes, but there is another unit of light which is far more practical, yet which is not at all so generally understood. This unit is the lumen.

So when you read 25, 40 or other quantity followed by "W" on a lamp, you may call it 25 candle power, 40 candle power and so on, but it does not tell how much light goes in any other direction, such as up or down. It does not tell us what we really want to know—which is, how much light we get the use of—how much falls upon our sheet of paper, if we are writing—how much lights up the page of our newspaper, and so on in all cases where light is needed. The lumen is the unit for this, as practical and correct, as the candle-power is not. It is one which expresses the light received upon any surface. The lumen, which is a Latin word meaning light, is simplicity itself.

Suppose we have a source of light

emitting the light of a candle. This is a candle-power. A beam of light from any source expands as it is more distant from the source, candle or lamp. The light of one candle at a distance of one centimeter from its source will illuminate a surface one square centimeter in area with a light of one lumen. The centimeter is approximately four-tenths of an inch; a square centimeter is about sixteen-hundredths, nearly one-fifth, of a square inch.

It would seem at first sight that the lamp should be rated in lumens, but a moment's consideration will show that this is impossible. The lumen depends on the light received by a surface of definite area. The candle-power is the measure of light emitted by a lamp or other luminary. The lumens received by a surface vary with the area of the surface and with the distance. At half the distance from a lamp, your book or paper will receive on a given area four times as many lumens as at the original distance. But the candle-power is the same.

Suppose you are reading your book at a distance of eight feet from a lamp and you cannot see the text clearly for want of what? For want of light you may say, but, to be scientific, suppose you say for want of lumens. So you move up closer, it may be to four feet. There you have a great increase of lumens, not a doubling of them, but a

quadrupling. You can read four times better than at first. You are getting four times as many lumens as before.

The same applies to mechanical operations. The workman must have lumens for his work.

Now suppose you cannot get near enough the lamp to get this increase. A convex lens placed in the beam of light will change it from a spreading beam to a parallel one and you will get the lumens which passed through the more or less distant lens. A concave mirror will do the same. The law of the lumens, varying in amount inversely with the square of the distance, no longer obtains. This applies on a grand scale to searchlights, which by their reflectors catch a quantity of lumens, stop the beams from spreading and send the lumens that fell upon the reflector far off into space. A mile off the same number of lumens per square inch or square foot may be received as were present within a few inches of the lamp, except as reduced by dust or fog in the air.

All this may be said using the word "light," but the term "lumen" has assigned to it a definite mathematical conception making it a unit. To make the whole subject mathematically correct, the original light should be emitted from a point. Yet the lumen is a very practical conception, even if in its application it may not give rigorously accurate conceptions of what is taking place.

NOTICE

We regret that, owing to lack of space in our columns, Bob Olsen's story, "Peril Among the Drivers," has been crowded out of this issue; it will appear next month.

Terror Out of Space

By H. HAVERSTOCK HILL

Serial in Three Parts—Part One

H. Haversstock Hill is a very well-known science fiction author. We are publishing the first instalment of a story dealing with space and with distant planets. The narrative with Dr. Edward E. Smith's story, of which an instalment also appears in this issue, go to make it an Interplanetary Number, and we know that the merit of these two stories backed by the reputation of their authors, will appeal to all our readers. It is in a sense entrancing to read about travels in outer space, and there are any number of people who believe that this will be done in the not very distant future.

Illustrated by MOREY

CHAPTER I

The Light in the Sky

“**M**Y next,” said Captain Spain thoughtfully, “is going to be a sea-plane. I’m getting rather tired of island schooners, even when they do have auxiliary engines.”

It was one of those baking hot afternoons that one strikes only in the Solomons, a day when the sun beats mercilessly down from a clear sky on a sea of gleaming brass, and even the jungle itself seems to sweat in the heat. Since early dawn I had been working on our schooner at anchor in the bay, but by lunch-time I had everything more or less ship-shape, so I decided to call it a day and get back to shore. For one thing it was far too hot to do any more work, and for the other the auxiliary engines had developed one or two defects about which I thought it just as well to consult Spain before I did anything further.

We had more or less thrashed the matter out at lunch, but later, when the four of us—Spain and Arabella, his wife,

Marian and I—were sitting out on the verandah of the bungalow, he came back to the matter, and presently dug up the idea that must have been maturing in his mind for quite the last hour or so.

I saw Arabella shift in her seat at the mention of sea-planes—one could almost imagine her shying like a startled horse—and a gleam came into her eye.

“You’ll break your neck,” she said calmly. “You’re too old to go monkeying about with these new-fangled inventions. Besides I don’t hold with them. To my mind flying in the air seems rather like tempting Providence.”

A remarkable woman, this Arabella, a leader and a pioneer, one who from choice had made her home in the rough places of the world, and had never cared a hoot about any man until she met Spain. Then in their Indian summer they had married, and . . . But the full story of that as well as my own romance is written elsewhere for those who care to read it.

Spain filled his pipe with studied deliberation, lighted it and puffed the blue smoke into the still air before he answered.

“I don’t know so much about that,” he



Through the observation window opened up in the forward part of the vessel, we were able to see the planet Mars grow from a small red disc to a great orange globe that presently began to fill the sky.

said slowly. "Almost anything is tempting Providence, if it comes to that. This is the twentieth century, you know . . . march of progress . . . and all that. We'll have to shed a lot of the old ways and old ideas if we want to keep pace with the rest of the world. Just think how quickly we could cover our factories and plantations if we could make our visits of inspection in a sea-plane. Of course we'd have to stick to the schooner or something like it for freight purposes, but . . ."

"But nothing!" said Arabella sharply. "I'd sooner be shot than go aloft in a sea-plane, and that's final."

It wasn't, though none of us could have been expected to know it at the time. I've often wondered since, what Arabella would have said or done had she been permitted even the slightest inkling of what was presently to happen, if she had even the faintest idea of what we four, first of all the human race, were presently to see. Yet I don't know. The chances are that she would have carried on just as before, have done precisely what she actually did, when the necessity arose. Arabella could always be counted on to do her share, even though she reserved the right—to use her own phraseology—to register her kick.

Neither Marian nor I said anything. For my part, though I would have liked to put in my oar I did nothing of the sort, but stared out to sea, and when the reflected light of the sun began to hurt my eyes, I shifted my gaze to the clear sky above.

Spain and Arabella still went on with their friendly wrangling, which meant so much at the time, yet ten minutes afterward mattered not one jot. We took no notice. They were, so to speak, merely letting off steam. Once or twice I heard Arabella mention my name, not in an entirely complimentary tone. Though, as I've said already, I wasn't actually listening I had a good idea of what she was

saying, something about the recent interest that I, in an amateur way, was taking in science, something about the dreams and the visions I sometimes fashioned for myself. I think she had a fancy I might have contaminated her husband . . . a little.

Perhaps I had, if interesting him could be called that. For myself I did not care much what anyone thought, Marian excepted, that is. She understood. She was interested herself, too. Once, you see, not so long ago in point of time, centuries it seemed when one lived through it, there had been a little Billy Harper. Then something happened—it hurts me even now to write about it—and our little son, who had been in this world but a few short months, passed out of it again. He had stayed just long enough to twine his tiny fingers round our heart-strings with a grip that would never be broken in this world or any other. And then . . . then we learnt there could never be another to take his place.

Do you wonder that I had to find new interests, new dreams, something to take mine and Marian's thoughts away from what might have been? Perhaps the whole thing was pre-ordained, mapped out from the very beginning, so that when our great adventure began, one of us at least should be in a position to comprehend something of what was going on. Yet there were others better fitted who could have been chosen, men whose names were household words in their particular domain of science, who would have given their very souls for the chance of standing in my shoes. But they did not, and that is all I can say of it.

Something of the sadness that tinged my thoughts, as old memories came back to me, must have communicated itself to Marian, for as I shifted my glance to her, I saw her expression change, soften a little, and her hand stretched out and

touched mine, ever so gently. Our eyes met.

I turned quickly away. It is not in a grown man to let others, even his most intimate and dearest, see the sorrow for what might have been brim up in his eyes. Instead I stared fixedly ahead at the clear blue of the sky.

Then I started and caught convulsively at Marian's hand. The sky was not so blue nor so unflecked as it had been when last I had looked. Something had happened in the interval. I can hardly describe in words just exactly what it was that had occurred. But somewhere away to the north, where, invisible, lay Florida Island, the sky seemed to have split in twain. It was as though a gleaming sword of bronze had riven the firmament, a sword that rushed swiftly on, glowing brassily as it passed.

Had it been night I might have guessed a meteorite; being day I felt it could be nothing of the sort, and so could only stare and gasp. I must all unknowingly have risen to my feet in my excitement, for, vaguely, as though it were a thing afar-off and unconnected with me, came the scraping of chairs as the others sprang up. From Spain came a muttered exclamation.

"**W**HATEVER is it?" said Marian's voice in my ear.

"I . . . I don't quite know," I said rather haltingly. "A falling star . . . a meteorite . . . something of the sort perhaps."

But even as I spoke I felt—knew—that it wasn't anything of the sort. I hadn't time to formulate any other alternative, however, for the thing, whatever it was, shot clean out of our range of vision as swiftly as it had entered it, leaving the sky as clear and unflecked as it had been before.

Yet it was not quite the same. A sense of heaviness and foreboding seemed to

hang in the atmosphere; the very air felt hotter than before, though that indeed may have been due merely to our over-heated imaginations.

CHAPTER II

Unrest in the Compound

NIGHT came down like the shutting of a box. The riding-light broke out on the schooner in the bay; the leading lights on the two tall palms near the water's edge twinkled and dipped and twinkled again as the night breeze stirred the trees. From the plantation compound came the hum of life, the voices of the Malaitan boys, toned down by distance, until the sound was no louder than the distant humming of bees. Yet there seemed a sort of twitter in it, an odd note of excitement that, queerly enough, made me think of birds before a thunder-storm.

We had given up speculating as to what it was we had seen in the sky that afternoon. Spain, with a pig-headedness that was by no means rare with him, maintained that it was some sort of air-ship, and nothing I could say would shake him out of that belief. He had been in Japan the time the "Graf Zeppelin" had made its historic 'round the world flight; he had caught frequent glimpses of it, and carried away in his memory a hazy recollection of its outline. It was in vain that I pointed out that an air-ship was invariably aluminum-sheathed, which would give it a silvery appearance in the sun, whereas the thing we had seen had glowed like bronze or red gold.

He retorted, not altogether without reason, that we were out of the world here, and that a good many advances could be made in aviation before we became aware of them, and that pace, and appearances and all the things I relied on to demolish his argument might well have

been improved beyond any recognition.

I hadn't any answer to that. The probabilities were that he was right, yet I felt deep down in my own heart, without exactly knowing why, that he was wrong.

For my own part I would have clung to the idea that what we had seen was a meteorite, had it not been for the absence of anything in the nature of incandescence surrounding the thing in the sky. Also it had not moved at quite the pace I would have attributed to a shooting star. True, I was not aware of any recorded instance of a meteorite having made its appearance in the day-time, but then that was nothing to go by. Altogether, of all the theories of which I could think, I leaned most to the one that what we had seen was some variety of shooting star, one of those innumerable celestial visitors, with which our earth is perpetually being bombarded.

There was nothing to tell us that we were both right—and both wrong.

To return to that odd excitement that seemed to have seized on the natives in the compound.

I was on the verandah when I first became aware of it, loading a pre-supper pipe, and trying to extract some comfort from the faint breeze that had sprung up after the heat and burden of the day. I'm not quite sure what Spain was doing—at any rate he was not within sight—and the women-folk, I could tell from the sounds of rattling crockery, were busy with some meal-time preparations in the bungalow. Retallick, our manager, had just left me to go off to his own quarters and spruce-up before he reappeared.

Narada, one of our house-boys, passed me at that moment, and struck by an idea I called him over.

HE turned and came back up the steps to the verandah, six feet of brawny New Georgian savage, his head crowned by a mop of carefully-teased hair that

might well have passed for a small umbrella at a casual glance. Not so long since he had been roaming the jungle of his native island, a head-hunter probably, a cannibal almost certainly. Now he was cook, rather a good one, probably because his past experience stood him in good stead, and civilized after a fashion. Yet a few hours sail from where we were, his friends and relations still lived as their like had lived, as long as their racial memories went back through time.

Not so long ago I read where someone—who should have known better no doubt—had said publicly that the world had grown smaller and that there were no places left unexplored any more on our planet. The North and South Poles had been conquered; men had flown completely round the world. Yet he was wrong. Even in this fourth decade of the twentieth century we have still much to learn about this globe on which we live. Vast sections of Africa have yet to be opened up; a slice of South America, the size of Europe, still remains unexplored; who knows what may yet be found in the interior of Australia, that vast island continent around whose rim between six and seven million white people still cling precariously; and what after all do we know of what lies hidden in the inner fastnesses of New Guinea, the jungle depths of the Solomon Islands, or in that last stronghold of Stone Age savagery, the New Hebrides?

Something of this crossed my mind as Narada came up the steps towards me, Narada who only a few years back had been living in a world several thousands of years younger than the world of us white men.

I dropped easily into *bêche-de-mer*, the *lingua franca* of two-thirds of the Pacific Islands.

"Narada," I said, "what name that fell boy make too much talk along compound?"

NARADA shifted from one foot to the other, the infallible sign of savage uneasiness all the world over.

I won't transcribe his replies word for word, given as they were in bêche-de-mer English, where every word is terribly overworked. The gist of what he said, however, was that he did not know. He said this in every variety of way of which he could think. I knew he wasn't telling the truth—I could see that by his shifty eyes and the uneasy movements of his bare feet, so I kept at him, pumping him in the way experience had shown me was most effective. At length:

"Boy belong compound fright like hell," he burst out elegantly.

It was an obvious conclusion I had drawn already; it was the exact nature of that fright and its precise cause that I was anxious to discover if possible.

A light cane table stood on the verandah. It had been in use during the afternoon, and the whisky decanter we had sampled then had not been removed. Whose fault that was I can't say. One of us—Spain or I—should have brought it back into the bungalow with us, and not have left temptation in the way of the boys. But as luck would have it none of them had discovered it. I could see the liquid still stood at its former level.

But the sight of it gave me an idea, made me do a thing that I suppose was foolish in the extreme. However I wanted information, and I wanted it as quickly as I could get it. I moved a little to one side, so that the contents of the table were no longer hidden by my body. My action was deliberate; there was little possibility of my purpose being mistaken.

Narada's eyes gleamed, the hungry look of a child eyeing forbidden fruits.

I TOOK up a glass in one hand, the decanter in the other, and casually as though I were doing it myself I measured out an exact three fingers of the neat

spirit. Then holding the glass in my hand I turned to Narada. His eyes wandered from the glass to my face, and he made a tentative movement as though to stretch out his hand for it. I drew back a step.

It was all done in pantomime, not a word spoken between either of us, yet this simple child of the jungle read my actions as plainly as though I had put my thoughts into words. The whisky was there, tantalizingly just out of his reach, yet readily obtainable the moment he told me what I wished to know. For one split second tribal secretiveness struggled with native cupidity. The latter, not surprisingly, won.

What little he had to say was interesting, though scarcely illuminating. In fact for the time being it left me rather more puzzled than before. The boys were frightened, utterly and terribly scared, and the basis of it all was their belief that they were going to be taken away somewhere, far away from home, which they would never see again.

All this, of course, was sheer nonsense, and so I told him. The boys would not be taken away, until their terms had expired, and then they would be sent where they wished to go, back to their own homes.

But Narada shook his head. It had happened before, long and long ago, he said. Strange men like white men, yet not like them, had descended on the islands in a "sikoona" with wings, men armed with things that were like guns and yet not like them, and these strange visitors had taken some of the natives away with them. They had never returned.

"OH," I said. I saw—or thought I did—a glimmer of light at that. What he was telling me was a mixture of half-a-dozen South Sea legends. A

"sikoona" (schooner) with wings? When the islanders saw a white man's ship for the first time, in the old, old days of sailing vessels, didn't they call it a "canoe with wings?" Somehow the spread of white sails gave them the idea that it could fly. Then those men like white men, yet unlike. . . . That could be explained quite simply. It was neither more or less than a garbled tradition of the ill-fated attempt made by the Spaniard, Mendana, in the sixteenth century, to found a settlement in the Solomon Islands.

So I told myself, so I would have explained it to Narada, only I felt he would not have understood. But as he had kept his part of the bargain, so I kept mine, gave him the whisky and watched him toss it off at one gulp. It must have burned his throat badly, taken that way, but with the stoicism of his kind he showed no sign of it.

I took the decanter and what was left in it back into the bungalow with me. No other native would have an unauthorized drink that night.

Yes, my explanation was quite a simple one, quite good and quite feasible. Its sole defect lay in the fact that it failed to explain why, this night of all nights, that ancient fear, one would have imagined had been forgotten and buried under the dead litter of the past, should have been so oddly revived.

Unless, of course, that queer portent in the sky was in some measure responsible for the unrest in the compound. But from first to last Narada had made no mention of it. Looking back on it all now I wonder why I did not at once make four out of the two and two facing me. But perhaps the reason why I did not can be found in the truism that few men find it at all possible to imagine beyond the actual limits of their experience.

CHAPTER III

The Red Light

SOME time later—I had returned to the verandah, after putting the whisky out of harm's way—Marian came out to tell me that supper was practically ready, and we stood for a few minutes talking before we went in.

The worst of the noise in the compound had died away by this time, though occasionally a faint whimpering like that of an animal in pain drifted up to us; the night itself was surprisingly clear even for these latitudes, and had it not been for the excessive heat, which still lingered in the air, it would have been an evening in a thousand. My first restlessness had passed off, and I was feeling now quite surprisingly peaceful, as though a great difficulty which had hitherto confronted me had suddenly ceased to exist. The others told me later that much the same mood had seized on them, about the same time. Whatever the cause of it, however, it was destined not to last very long, for quite soon a number of disturbing things began to occur.

At supper I told the others of my talk with Narada, though I must own I suppressed altogether the matter of the whisky. Arabella had strong views on the subject, where natives were concerned, and I had experience enough of this masterful woman not to wish to run counter to her more than was absolutely necessary.

Narada's explanation of the trouble in the compound she characterized as bosh. "Whatever's back of it all, it isn't what he told you," she declared.

Spain himself, however, was not so much inclined to be sceptical. He had a latent streak of romance in him—but for it he wouldn't have married Arabella, I presume—and it had the effect always of encouraging him to seek the picturesque

in preference to the practical explanation. He thought there might be something after all in what Narada had told me, but I judged from the little he did say, which one could seize on, that he was thinking more of old tales of the blackbirders than of other possibilities.

"Getting back to my old idea of a sea-plane," he said later during the meal, "has it ever struck you what great possibilities to—well, say a sort of modern pirate, with a sea-plane instead of a ship, this part of the world offers?"

FRANKLY it hadn't, but, the moment he spoke about it I saw that he was right. Almost all the way from Sydney to Hawaii, the Pacific is peppered with islands, large, small or almost negligible, islands of all sorts and conditions. The worst of them—by which, from the pirate's point of view, I mean the best of them in the sense they are least settled and least explored—lie in that triangle whose apex is New Guinea and whose base is a line drawn from Sydney to Suva. Practically all Panama and Frisco traffic from Australia passes through the triangle; much of the traffic is rich, and not so seldom the liners carry specie, often enough to make it worth the risk, as they say.

A pirate in a swift sea-plane, with his nest somewhere in the maze of islands, could work havoc before the inevitable combing-out located his base.

"And," I said, taking up Spain's idea, "you're thinking something of the sort may be on foot hereabouts?"

He nodded. "I'm only suggesting it as a possibility, of course," he answered.

"And you'd explain what we saw this afternoon in that fashion perhaps?" I pursued.

Now it came to the point he was not quite so ready to take a definite stand, but, "Ye-es," he said a trifle doubtfully, and seemed prepared to let it go at that.

"Well, I wouldn't," I said triumphantly. "And my main reason is that if a plane of any sort had been traveling fast enough to get as hot-looking, as the thing we saw, the whole contraption would have been incinerated. Man and plane and everything in it would have been blown to atoms long before it reached that stage. Anyway there's not a flying machine of any type yet built that could travel half as fast. All things considered, it's more likely to have been a meteorite of sorts than what you suggest."

"What," said Arabella distinctly, "does it matter after all? I don't see why we should worry our heads about it. Marian, don't you think we should change the subject, by trying to find out what's on the air to-night?"

"I hope we can tune in on a musical program," said my wife a little wistfully.

I looked at my watch, and did a mental calculation. Sydney's evening broadcast should be just about starting now. I pushed back my chair, got up and approached the radio set in the far corner of the room. It was a particularly powerful one, the best I could buy, and hitherto I had had no trouble with it.

I MADE the necessary adjustments, turned on the loud speaker and waited. By rights we should have cut bang into the middle of Sydney's evening broadcast, but we did nothing of the sort. The thing remained dead save for some queer noises, very faint and rather odd, that did not sound like any species of atmospheric interference I had yet encountered.

"Won't it work?" Marian asked. "Sure you've got the right wave-length?"

I wasn't willing to swear to anything, despite the figures on the dial in front of me. Of one thing, however, I felt tolerably certain and that was, that, wherever the fault lay, it was not in the set itself.

Still, clearly enough, it was a case for experimentation.

What I would have done does not matter much, for at that precise moment something happened that startled me. Those queer faint noises, I have already mentioned and for which I could not account, had been going on all the time, not very loudly, it is true. Indeed they were just within the limits of audibility. But now, almost on the heels of Marian's last question they suddenly grew in volume and clearness.

The sound came so abruptly, and seemed so startlingly close that involuntarily I took a step back.

"What have you done now?" Arabella said in her sharp way. "What station's that?"

Then she turned in her chair and saw my face.

I don't quite know how to describe the sounds, even now when I know what caused them. They were hardly music as we understand the term, though there was a decidedly musical note in them. Also there was a sort of odd pulsing rhythm in them that showed they were not the result of pure accident, and it was the realization of this more than anything that made me listen intently and hold up my hand for silence. A message of some sort I would have sworn, had I known of any station in the whole world that used that peculiar code of melody.

I DON'T know what it was that made me glance at my watch; some idea perhaps of finding a periodicity in the sounds; at any rate as I mentally noted the time the sounds suddenly ceased.

For quite a space no one moved or spoke, then: "It was music . . . of a kind," said Marian. "I'd like to know where it came from. Could it be anyone having a joke?"

"I hardly think that likely," I returned. It wasn't the sort of joke one could play

and get away with. Then, too, there was something in the rhythm of those sounds that made me think there was a definite purpose behind them. The idea in my mind was quite preposterous, I told myself, and for that very reason I preferred, for the present at least, to keep it to myself.

"There they go again," said Marian quickly. "No, they're fading."

She was not altogether right. The sounds did not fade. But they were quite faint. They possessed nothing of the volume of those that had ceased only a few minutes previously. The latter might have originated in this very room; the ones to which we were listening now came weakly, from a distance.

"It almost sounds," said Arabella, with a queer expression on her face, "as if one's an answer to the other. This didn't begin until some minutes after the first one stopped."

"To be quite precise," I said, "there was an interval of exactly three and a half minutes. I timed it." I tapped my wrist-watch.

The exact significance of that passed the women-folk by, but some glimmer of what I meant must have reached Spain, for I saw his brow wrinkle up, as though he were trying to do some calculations in his head. They must have been rather too much for him, however, for presently he fell to figuring with a pencil on the table-cloth in front of him. Before he could reach any satisfactory result, however, Arabella interfered with some remark about the washing, and the difficulty of removing indelible pencil marks from white linen.

THE sounds ceased all of a sudden, and then rather to our surprise Sydney came on. I listened for a while, half-hoping that the broadcast station might have something to say about this super-imposition on the program, but

strangely enough no one there seemed aware that there had been any interference.

Probably we would have forgotten about the matter, at the very least have attributed it to some freak of atmospherics and pushed it into the background of our minds had not it been for the second strange incident that occurred later in the night.

It was just about that hour when one feels it is still too early to go off to bed, but rather too late to settle down to any definite occupation, and as a consequence we were doing nothing. The two women were talking—they always seemed to find some subject for conversation; I was discussing what I felt was my final pipe that night, and Spain—as I could see through the open door—was leaning on the verandah rail, seemingly interested in the panorama spread before him. Or perhaps he was merely thinking.

"Billy, you others, come here quick!" It was Spain's voice and a certain urgency in it brought me to my feet with a snap. In three strides I was beside him. The others came following after me.

"What it is?" I asked.

For answer he pointed southwards over the drab jungle. For a space I could see nothing, then gradually I became aware of a red glow through the trees.

"A fire," I exclaimed.

"Who could have lighted it?" he queried. "It's off our territory, yet it's rather too close to it to be a camp of the hill-men. Besides they wouldn't dare."

"Perhaps not," I said, "but then there's no saying what will start a fire."

"Wait and see before you make up your mind what it is," he advised, and his hand rested a moment on my arm.

Now I came to think of it, there was something queer about the red glow. We call a fire red, and in a way I suppose it is, but there was a certain quality in this that one doesn't usually find in fires,

the quality of a steady, unwinking brilliancy. There was neither flicker nor fluctuation. Somehow the glow made me think, after I had been staring at it a minute or so, of a ruby with a light behind it. Then I saw that it seemed to have grown, or else it was coming nearer. Whatever it was, it wasn't a fire—that much was certain now. In that still air the smell of burning would have carried miles, particularly from a fire big enough to glow as this one seemed to do.

"**M**Y God," Spain cried, and he caught convulsively at my arm, "it's rising in the air now!"

As a matter of fact it was doing nothing of the sort, though the mistake was excusable enough. The glow itself had shrunk, or concentrated, and from its heart there sprang something like the beam of a searchlight, only that it was red, a glorious, dazzling, scintillating red, that it was almost more than the eye could beat to look upon.

The beam itself wheeled up to the sky, played there a moment, shortened its length and came back to earth in full circle. The edge of it passed no more than a dozen feet above the roof of our bungalow, filling the air with a strange hissing as it passed.

A bare flag-pole, on which from time to time we hoisted our signals, stood in the middle of the clearing just beyond the bungalow and the red beam, as it wheeled, touched it for a moment about six feet from the top. There was no sound of any sort, but the portion of the flag-staff in the path of the beam glowed brilliantly for a second or so, and when the light had gone and we looked again the pole was six feet shorter. While one could count ten the bungalow, the clearing and the jungle about glowed with the reflection of that unearthly radiance, then the beam and the source from which it sprang faded altogether, snapped out, in-

deed, as one would switch off an electric light.

The soft starlit darkness of the tropics dropped down again on the island.

CHAPTER IV

Retallick

THE sheer unexpectedness of this thing, so utterly different from anything we had ever experienced, must have frozen our faculties, and for a perceptible space of time rendered us quite incapable of sound or movement. But at last an odd sound, half groan and half sigh of relief, came from Arabella.

"What, in the name of fortune, was it?" she asked in a hushed voice, so different from her usual sharp tone, that it was obvious she had for once been badly scared.

"I don't know," I said, telling the literal truth. By now I could have hazarded a guess, pretty close to the actual truth, too, I fancied, but I was so certain it would seem fantastic to the others that I decided to keep my own counsel, and let events justify or shatter my belief, just as they would.

"It was a ray, a light of some kind," Marian said. "Only that it was red, one would have taken it for a searchlight."

"I've never yet seen the searchlight that could slash through a flag-staff," Spain said grimly, voicing my own thoughts. "Billy," he turned to me, "do you feel equal to having a look at the pole and seeing just exactly what happened?"

I hesitated a moment, not because I was in the least afraid—I can own to that now with a clear conscience—but I hardly liked leaving the women-folk by themselves. Then it came to me that in the circumstances our presence as a measure of protection was more or less valueless;

they would be no safer with than without us.

"All right," I said, "though I don't suppose we are likely to find anything very illuminating."

We went down the steps and across to the middle of the clearing. I repeat that I wasn't afraid, but knowing we were facing weapons and conditions of which we knew absolutely nothing, I kept a wary eye on that spot in the jungle where the red glow had first appeared. But darkness, deep and intense, reigned there unbroken.

There was light enough to see the flag-pole by. Six feet of the top of it had been cut through, as clean as though by a circular saw. Oddly enough, however, none of the rest of the pole had been touched; the paint on it had not even been blistered. I hunted about on the ground at the base of the pole, thinking I might discover some trace of the severed piece, but though I struck match after match I could see no sign of it, not even a scraping of ash. In the light of that there was only one possible conclusion I could draw. The red ray, whatever its nature, had concentrated such intense heat that that part of the flag-pole it had actually touched had been absolutely and spontaneously consumed. At least that was my interpretation of it at the time.

Seeing there was nothing to be alarmed there, we came back to the verandah. It was only then that I recollect that Retallick, our manager, had not been seen since he went off to his quarters some time before. There was nothing very much to worry about over that, the more so as the beam could not have passed anywhere near him, but the mere fact that he had not appeared seemed rather significant. For one thing the intense light of the beam must have been visible for some considerable distance around; I know that it lit up the clearing and the surroundings of the bungalow with a

vivid unearthly brilliance that made all things as clear as day.

I mentioned the matter of Retallick's absence to the others, mainly because I wanted to see what they thought about it. Then, too, I had a queer idea in the back of my mind that it might be wise to set some sort of a guard that night, and if we decided on doing anything of the sort, of course, Retallick would have to take his turn. No one could say what the next few hours might bring forth, and though there was nothing to be gained by all of us remaining awake, there was no sense in running the risk of being taken by surprise. Looking back on it all now, I fancy the thing that most influenced me was the possibility that the succession of phenomena we had experienced might have its effect on the natives in the compound, and I had no intention, if I could help it, of being murdered in my sleep by a crowd of fear-crazed ex-cannibals.

The others took a practical view of Retallick's absence. Arabella voiced their opinions when she said that no doubt he had already gone to bed, and had simply slept through it all. She pointed out in support of this contention, what I should have recollected for myself, that Retallick was an early riser, who made a point of seeing that the work of the plantation was well in hand before the rest of us had breakfasted.

It was so eminently a sane statement of the position that my first wild fears, banished almost the moment they were conceived, seemed now foolish and unreasonable. None the less, calling Spain aside, I made my suggestion about the guard to him, and finding he agreed we went off together to Retallick's hut.

The place was in darkness and the door shut. I had to knock twice before I could get him to answer, and when he came and unbarred the door it was with a rifle in his hand. Not the kind of man to be taken unawares, evidently.

"I HEARD you the first time," he explained, looking from one to the other, "but most voices sound alike when you're roused out of a sound sleep, and I took care to make sure who it was before I opened the door."

He showed us, what I had not noticed before, a couple of tiny peep-holes, obviously made with a gimlet, set in the middle of the door at such angles that he was able to identify any uninvited visitors with a minimum of trouble.

Briefly I told him what we wanted. He had seen the strange light flashing across the sky earlier in the day, and had taken it for some species of shooting-star, he said. His interest in it apparently began and ended with its effects on the hands. They had seemed a bit scared about it, but had quieted down after a time, and he took it for granted that they had got over the worst of their fright.

He glanced at me sharply when I detailed the incident of the ray, and I fancy that for the moment he was inclined to believe I was romancing. But we soon convinced him that we were in earnest, and then his face changed.

"You mean it's something extra-terrestrial we're dealing with?" he demanded coming straight to the point.

"Quite probably," I said soberly, "though, of course, it's far too early to form any decided opinion about that yet."

"I don't see what else it can be," he said with knitted brows, "and by the same token what can we do if we're attacked?"

"Better get that idea out of your head at once," I said sharply. "There's been no suggestion of anything of the sort yet. I'm inclined to believe the only piece of damage that ray did was sheer accident, and I think we should proceed on that supposition until we learn otherwise. At any rate it won't leave us any the worse off. Now, how about fixing up this guard? Are you willing to stand your turn and lose some of your beauty sleep?"

"I'm your man," he said without hesitation, smiling up at me. He was one of those dark-eyed, curly-haired imps whom most women—God knows why—take to on sight. Luckily perhaps for them he was entirely without vice, which was one of the many points in his favor.

"Well, if you are," I retorted, "get out of your pajamas and into some clothes and come across to the bungalow as soon as you can. Meanwhile we'll get the ladies off, so we'll have a clear field when you arrive."

"All right, Mr. Harper," he said easily. "I suppose I'd better bring the gun."

He nodded towards the rifle in his hand. I hesitated, then, "Yes, perhaps you'd better," I said.

We left him to get ready and went back. Marian and Arabella had already guessed more or less what was on foot, so we made no attempt to hide the precautions we were taking. I told them, however—which was the exact truth—that we weren't anticipating any real trouble, but felt it was much better to be sure than sorry. After some arguing we managed to persuade them to go off to bed, promising we'd come as soon as we could.

RETALLICK turned up a few minutes later. It was his suggestion that he should take over for the first watch, call me for the second and leave the third to Spain. His own explanation was that as he was up now, he might as well stay up, rather than go back for an hour or so and be rooted out again, but really I think that, recognizing Spain was the oldest of the three, he wanted him to have as much rest as possible and conserve his strength with a view to any demands that might be made on it later.

I pointed out to him the exact spot where the light had first appeared in the jungle, and emphasized my own opinion that it was there we might expect any new

manifestation to originate, that is, supposing it was not the natives with whom we had to deal. I cautioned him, however, not to fire unless there was no doubt he was going to be attacked, as we had no intention of precipitating trouble of any sort if it could be avoided.

We fixed the times we were to be called, compared our watches with his and left him to his own devices.

"By the way," said Spain as we entered the bungalow, "are you sure it was three and a half minutes between those two series of sounds we heard over the radio?"

"Three and a half minutes exactly," I said. "Why, what are you trying to work out?"

"The reason why that length of time elapsed between the two series," he said. "It's a case of distance, of course. Forty million miles in this instance."

I shook my head. "You're wrong," I said. "You've doubled the distance."

He looked puzzled. "How?" he said.

"It's simple enough," I pointed out. "Assuming that what we heard were two distinct messages—call the loud series of sounds 'the message' and the fainter series the 'answer' the latter would not start in all probability until the former had ended, so that forty million miles of yours is the total for the round journey, there and back. The actual distance is only twenty million miles."

"I see," Spain nodded. "I jumped at the idea of forty million miles without thinking, simply because I remembered that Mars at its nearest is about that distance from us. I thought someone might have found some way of sending a message there and getting one back."

"We'd have heard of any such attempt, I should imagine," I pointed out. "But even supposing some one was experimenting in secret, why talk of getting messages back? The faint sounds we heard and that we've decided to call the 'answer'

might merely be a sort of echo. Anyway the fact that the vibrations—you'd better call them that, for that's what they were—traveling at the light speed of 186,000 miles a second only traveled twenty million miles—disposes of your idea that someone has been trying to communicate with other planets. Eros, I think from memory, is about the only planet, or rather asteroid, that comes as near to us as that, and it's not due in that position for some considerable time yet."

"That's so," he said thoughtfully. "Well, it looks as though my idea won't work. We'll be all the better for sleeping on it, anyway. The morning might bring forward some solution of the mystery."

"It might," I said. "Good night."

Marian was already in bed, but she was not asleep. She wanted to talk over everything that had happened and get my considered opinion of matters, but I was rather reluctant to express any views, mainly because, of the half-dozen possibilities that flitted through my mind, not one seemed to cover all the facts of the case. Anyway, in view of eventualities I wanted to get all the sleep that was possible. I did not trouble to undress, but lay down in my clothes as I was, ready for the call when it should come in a few hours.

I AWOKE with a start to the fact that it was broad daylight, and for the moment I was more than half convinced that what had gone before was no more than a singularly vivid dream. But the sight of my dressed condition, no less than the fact that to save disturbing Marian I had gone to sleep by myself on a made-up shakedown on a cane settee convinced me that I was dealing with events that had actually happened.

Why then had I slept right through the night? What had gone wrong that Retallick had not called us? It was al-

most certain that had he been attacked and overpowered I would have been awakened by a noise of some sort, for normally I am a singularly light sleeper. Indeed the fact that I was still alive and able to wake up at all was sufficient indication that whatever had occurred it was not the sort of attack in which Retallick had succumbed to odds against him. But this, after all, only made the whole affair all the more inexplicable.

I slipped out of the room, taking instead of my rifle the handier revolver I had buckled on over-night. Spain's door was shut, but I knocked on it in passing, well knowing that he would come out at the signal without my having to wait and explain matters to him. I went straight out on the verandah, and made for the spot where we had last seen our manager.

The verandah was empty. The chair he had occupied was still there. Scattered about on the ground just beyond the verandah rail were spent matches and the ends of the cigarettes he had no doubt smoked to keep him company during his watch. Signs of a struggle there were none. Nevertheless the singular fact still remained that Retallick and his rifle had vanished as completely as though the earth had opened and swallowed them.

CHAPTER V

What the Morning Brought Forth

I STARED about me. No signs anywhere of a struggle. For all I could see from where I stood the man might simply have walked off. But since I knew that could not be the real explanation I immediately began to look about for some other one.

For a start I got down to the ground level and began to count the cigarette butts strewn about. There was method in this, for, since both Spain and I were pipe-smokers, it followed that the remains

of any cigarettes must be of Retallick's.

There were five cigarette ends, and two spent matches. Allowing that it would take an average of ten minutes to consume a cigarette Retallick had been on guard at least fifty minutes before anything had happened. Probably a longer time had actually elapsed, for I did not think it likely that he had lighted his first cigarette the moment we left him. Against this, however, was the fact of the matches. Since he had used only two the chances were that he had done quite a lot of chain smoking. On the whole one was safe enough in reckoning that at least seventy five minutes must have passed before Retallick disappeared.

It had been half past ten when we left him; therefore some time in the fifteen minutes before midnight he had walked, or been spirited away.

A step on the verandah made me look up. I had a faint hope that after all it might be Retallick himself come back to explain, but a glance showed me it was only Spain. He had just stepped out of the shadow of the doorway, though somehow I got the impression that he had made a careful reconnaissance before showing himself.

I called softly to him and he came down the steps.

"What are you doing there, Billy?" he queried. "Going fishing and looking for worms first?"

Then something of the incongruity of the situation must have dawned on him, or perhaps he saw in my face my disapproval of his untimely levity.

"Good Lord," he said uneasily, "what's wrong, man?"

"Spain," I said, straightening up and looking him in the face, "what watch did you take?"

"What watch did I take?" he repeated, his face screwed up in a puzzled frown. "Why . . . Billy, I wasn't called."

"Neither was I. I woke up in broad

daylight. It was I who knocked on your door just now."

"Then . . ." He stopped and swept a glance round the verandah and its neighborhood. "Where's Retallick?" he demanded.

"That's more than I can say with any certainty. Something happened round about midnight, that seems to be all I can be sure of." I told him briefly how I arrived at that idea.

He pointed out the one weak spot in my deduction, the possibility that something had happened to bring Retallick to the alert, and stopped his cigarette smoking for the rest of the watch.

"For the rest of the watch," I said. "Quite so. His time ended at half-past twelve, so there isn't such a big margin after all. No, whatever it was happened before midnight."

"Why? How do you make that out?"

"There was a full moon last night at 11.24 P.M. By midnight it would have risen far enough to have made the clearing and compound as bright as day. Whatever happened to Retallick took place in the dark. You see that?"

Spain nodded. "More chance of him being taken by surprise in what darkness there was. Yes, that seems feasible. But I'd suggest that instead of standing here looking at the ground we have a cast about and see if there are any possibilities further afield."

"Good man. I'd have thought of that myself in time, but it's just as well to do it now. By the way, is Arabella awake yet?"

"She is," said Spain grimly, by which I judged she had been using her tongue to some effect. Perhaps Spain had been rather tardy in answering my signal.

"You needn't worry about your little lady," he added.

I wasn't, not very much. But the fact that Arabella was up and moving about gave me the feeling that Marian had

someone on whom she could rely if need be in my absence. You see, the search for traces of Retallick might drag out longer than we anticipated.

AS a matter of fact we came across signs of a sort much sooner than we expected. The compound lay on one side of the bungalow, remote from the bay, so that absconding natives who meant to escape by sea could not help but pass by our residence. The bungalow itself fronted the bay, while the third and fourth sides, save for the clearing that ran back for seventy to a hundred yards, were bounded by what was still more or less jungle. It was roughly from this direction that the beam of red light had come the previous night and naturally enough it was there we first thought of looking once we had satisfied ourselves that Retallick's disappearance was not due to the action of the natives in the compound.

The jungle itself, if one can so describe that tangle of trees and undergrowth, was traversed in several directions by narrow paths that had been hewn out by main strength and that required frequent attention if they were to be kept open. They were meant merely as footways and were just wide enough for one man at a time to pass through.

But presently as I cast about some peculiarity, in what I took to be one of the paths, caught my eye. It seemed wider than the others, considerably so, and I had a sense of greater depth to it. Naturally because of the gloom due to the trees meeting overhead and shutting out the sun I could not see very far down it, nevertheless it gave the impression of extending much further than the other paths.

That was the first thing that struck me about it. The second was it had been driven as straight as an arrow and the sides of it were as smooth and regular as

though they had been trimmed and pruned. An idea came to me, and I went back to the base of the flag-staff, then turned round. There was no doubt at all about it now. The red beam had driven this path through the jungle and it was probably sheer accident that the upper portion of the flag-staff had been shorn off by the ray.

Spain looked more than perturbed when I explained what I was driving at. I think he began to see some of the thing's implications then, if he had not half guessed them already. At any rate he made for the path or tunnel—call it what you will—that ran back through the jungle, and then:

"Billy, come here, quick," he cried.

I strode to his side. The ground where he was pointing, perhaps because for some reason or other rather more moisture than normal had gathered there, was quite soft. Or rather it was plastic enough to take impressions without losing its consistency.

I'm not quite sure what I expected to see, footprints of some sort, I suppose, and that, after all, is what I must call the things on which my eyes rested. But they were like no footprints I had ever seen before. They were not the clear imprints of naked feet such as the natives would leave, neither were they the impressions of white men's boots or shoes. But instead:

THE shape of each print was roughly oblong, though one end seemed a trifle narrower than the other, and the whole of it was cut into tiny little geometrical designs whose exact function escaped us. Altogether, as Spain remarked, the print was much the same as one would make by pressing a rough oblong of fine mesh wire netting evenly on the ground.

"Queer sort of feet," said Spain, which

only shows how close one can get to guessing a problem and yet miss the solution.

"Shoes of some sort more likely," I suggested. "The prints, I mean. At any rate we can take it as evidence that we've visitors the like of which this world has never seen before."

To both our minds there was no doubt at all about that. Still despite the fact of Retallick's disappearance we were in doubt as to whether they were hostile or otherwise. That they had taken away our manager was established beyond cavil in the next half-dozen yards when even softer ground began to yield the impressions of his own shoes. He was walking then, which was all to the good, and the unhurried evenness of his pace suggested that he was not being forced along. There was not even the occasional faltering that one sees almost inevitably in the footprints of a man who is being urged against his will. Yet it seemed rather like stretching our faith to assume that he had cold-bloodedly deserted us.

We followed up the tracks until the deepening shadows warned us that we were getting further into the jungle, possibly beyond our depth.

"We'd better go back now, Spain," I said. "We're not likely to gain anything by plunging bald-headed after them. At any rate we've found out where Retallick has gone. Sooner or later we'll probably find out why. In the meantime we'd better get back to the bungalow and hold some sort of a council of war, before we decide on the next move."

"Much what I was going to suggest myself," Spain agreed. He cast a glance back along the dim end of the tunnel as though he might by chance see the missing man himself standing there. We both caught sight of the gleam of metal at the same instant, but Spain was nearer to it than I. He dived his hand into the un-

dergrowth and brought out a metallic cylinder about a foot in length and made of some silvery-looking substance not unlike aluminum in appearance. Its weight however speedily disabused us of the idea that it was made of anything of the sort. One end of it had a metal clip attached as though it was meant to be hooked on to something and the other end bulged out into a sort of bull's eye of what I took to be glass. Indeed the whole get-up of the thing resembled nothing so much as an extra large electric torch or spotlight. There was even a sort of switch-button, though this curiously enough was on the end near the clip.

Spain pressed the button. Fortunately for both of us he was holding the torch-like thing with the bull's eye end pointed skywards. Fortunately, indeed, for at the pressure of the button an intense beam of red light as thick as my wrist shot out and the air about it of a sudden seemed to become baking hot.

With an ejaculation Spain released the button and all but dropped the torch as I suppose I must call it. The beam vanished, and in its place came a narrow shaft of hot sunlight dropping down on us. I shaded by eyes and looked upward.

Where before had been a roof of dull olive jungle there was now a cone shaped hole in the trees through which the sunlight poured. The red beam spreading out fan-wise had blast a clean-cut tunnel through the foliage above us. I gasped. But for the accident of the way Spain had been holding the torch it might just as well have been one of us.

MY partner himself was white and shaking with the realization of what we had just escaped.

"The last time I'll monkey with anything I don't understand," he muttered, and made a movement as though to throw the torch back where he had found it. But I stopped him.

"Better hang on to it," I advised. "You never know how useful it may be. Any-way it gives us some clue to its owner. Probably it dropped from his belt, though I can't understand how he could lose a thing of its weight without becoming aware of it. But come on now, let us get back before we have any more unpleasant experiences."

Both Arabella and Marian were immensely relieved when we put in an appearance. They had seen the red flash through the trees and remembering what had happened the previous night were beginning to put the worse possible construction on the whole affair, when we hove in sight. Indeed Arabella was already digging out her pet weapons and talking of arming the boys and leading them to our aid, or if it was too late for that, of attempting to conduct some sort of a punitive expedition.

We made some sort of a scratch meal, while discussing what we should do. Plainly our first duty was to ascertain what exactly had come over Retallick. Of course we could do no more than guess wildly about the nature of our unseen visitors. So far they had managed to keep invisible, though as I pointed out if they were actively hostile they had missed a few good opportunities of wiping us out. For a large part of the night we had lain asleep and at their mercy, and even apart from that, the red ray of theirs was quite capable of blasting us into nothingness at any time they wished.

All things considered I inclined to the belief that any outbreak of hostilities would depend largely on ourselves. Possibly they were in much the same position that a white expedition in a savage country would be—ready to defend themselves if necessary, but with no intention of taking the initiative, unless forced into a position where they would have to do so.

"I'm not troubling about who they are, where they come from or what their intentions are," Arabella declared. "Also I haven't any intention of starting a fight if it can be avoided. But Retallick has gone off with them, and no matter what you say you can't convince me he went of his own free will. It's not in nature. So in the light of that I'd suggest the best thing we can do, the minute we're ready, is to see what lies at the other end of that tunnel, and I won't be at all surprised if what we find gives us the answer to everything."

"That's much what I think," I said. It was remarkable how close we were to unanimity in our ideas that morning. For perhaps the first time in our association there was little or no argument of any sort. "And my own feeling," I ran on, "is that the thing we saw yesterday afternoon, and that is probably now at the other end of that path, is what brought these strangers to earth."

"Still harping on that idea of them being from one of the stars," said Arabella with a sniff. "More likely they're Bolsheviks. Look at the color of that ray, for instance."

Arabella's ideas of the outside world are a trifle hazy; she takes her opinions more or less ready-made from the papers that come up from Sydney once a month, and I fancy that she credits the ruling powers of Soviet Russia with rather more collective intelligence and malignancy than they actually possess. Still in this mixed world of ours she is entitled to her own opinions as long as she doesn't try to force them on others.

While we had been together she had sniffed, which is not quite the same as sneering, at my belief in a plurality of worlds. I felt, I often told her, that there was no reason why some at least of the other planets should not be inhabited; it was a monstrous waste of good ma-

terial if they weren't. To which she would reply with equal truth and with that sublime egotism, with which man has always regarded his own place in creation, that she failed to see why they should be. In the nature of things neither of us could ever advance an argument conclusive enough to shatter the other's convictions.

"Well, never mind who they are," I said soothingly. "That will all come out pretty soon, I fancy. The main point on which we're agreed is that we follow the trail Retallick took until we learn something definite about his fate."

I HESITATED before I went on, for the rest of what I had to say was not easy to put into words. I did not like the idea of taking the women-folk with us, and it would be just as bad to leave them behind in the bungalow. But our schooner, the *Dim-Dim*, was riding at anchor in the bay, all ready for sea. Arabella was a competent navigator herself and she and Marian were each quite capable of handling the native crew. Once get to sea and away from the island they could lay a course for Tulagi, the seat of government over on Florida Island, where they would be as safe as they were likely to be anywhere.

But they guessed what I was driving at before the words were half out of my mouth, and for once they had their minds made up and were unanimous about it. Apart from any other reason—this was Marian—they were quite as curious and as anxious to solve the mystery as we ourselves, and they flatly refused to be left out.

In view of the united front they put up we could not do less than let them have their way. I sighed and gave in, much against my better judgment.

As it turned out afterwards it was about the best thing I could possibly have done.

CHAPTER VI

The Stellarites

SO we armed ourselves, picked out half-a-dozen of our most reliable boys, and, much against the latter's wishes, set off down the tunnel-like path the strange ray had blasted over-night. We went gingerly. I must own that once the shadows closed about us, our courage began to ooze away, and we felt nothing like as brave as we had felt earlier, out in the bright, hot sunlight. A mouse that has somehow wandered into a drain-pipe only to find a cat waiting at each end must have felt much the same as we did.

The path was perhaps a mile and a half in length, and just about wide enough for three people to walk abreast. Its immediate purpose puzzled me. I was quite sure that there was some design behind it, for even then I could not imagine our visitors, whoever they were, going to so much trouble simply for the sake of effect.

As we progressed the point of light that was the opening at the other end began to expand. The jungle on either side of us was filled with an interminable soft rustling that ordinarily we would never have noticed, but now with our nerves keyed up it sounded as though unseen foes were shadowing us all along and gradually herding us into a trap at the end, from which there was no escape. Add to this the fact that the natives had somehow sensed what was in the wind—an unaccountable fear had settled on them and set them whimpering—and you have some idea of the uncanny accompaniment to which we moved.

Surprisingly enough in one way we were not hindered in the least, though the very fact of that only made me all the more convinced that we would be dealt with quite efficiently at the end of the path. More and more as the minutes

passed did I begin to doubt the wisdom that had brought us all along here together. It might have been better had one of us gone off first to reconnoiter; at the very worst it would have meant only one casualty instead of ten. That, however, could not be helped now. As things turned out, though the course I took was, in the last analysis, the best possible one. You see, of the whole of the island no one place was safer than any other, and that being so, the fact that we were all congregated together and heading for the one objective, did not make the situation any better or worse.

We came to the end of the tunnel, and emerged into sunlight so bright that, after the shadowed gloom of the path, our eyes were momentarily dazzled.

I must have fixed in my mind beforehand some sort of picture of what I expected to see; I would not have been at all surprised to find a scene of desolation with the trees and undergrowth all scarred and torn, blasted and shrivelled by a great heat—the terrific speed at which the thing in the sky had been moving must have generated that idea—but I was in no sense prepared for what actually met our eyes.

Twenty four hours before, the spot must have been in the thick of the jungle. Now every tree and scrap of undergrowth over an area of perhaps four hundred yards or so each way had utterly vanished, leaving the ground, what I could see of it, smooth and level.

I say "what I could see of it" advisedly, for a greater part of this space was occupied by an erection the like of which none of us had ever seen before. At first glance it looked like a monstrous Zeppelin, but in reality it possessed essential features of difference. It was only when I looked closer that I saw that it had none of the stream-line effect; it was actually the same width at nose and tail as at the centre. The two ends

rounded off gently in a way that would have given the machine a sausage-like appearance were it not for the number of warty protuberances clustered like cartridges round nose and tail. At odd places along the sides were others of these protuberances; they looked curiously like guns of some sort, and it was only gradually it dawned on me that they were rocket tubes. Their particular function was to be made plain to me later on.

The whole of this ship of the skies, as it undoubtedly was, was made of a golden bronze substance, curiously translucent, and with the rays of the sun on it, it shone with a brilliancy of beauty that almost took our breaths away.

The sight was so novel and so wonderful that we stood stupidly staring at it, drinking in the amazing wonder of it all. I don't think any of us heard a sound; it was probably instinct that made us turn about almost in unison. It was then we saw our first Stellarite . . .

HE was standing on a little knoll behind and to the left of us. We had passed it as we emerged from the tunnel-like path, but I'll swear there was nobody there then. Seven feet at least he was, a grave immobile figure, that stood as still as a statue of stone. He was dressed in a tunic and shorts of some serviceable, blue material. His legs from knee to ankle were bare, but his feet were encased in some sort of metal sandals. His head, which was covered with sleek, short black hair, was likewise bare, and, oddly, it occurred to me to wonder then how he was able to withstand the fierce sunlight beating down on him. Any of us white men would have gone under with sun-stroke.

For the rest his complexion seemed rather like that of the American Indian; his features had something of the same clear-cut, eagle-like look about them, and

he held in his hand a metal cylinder similar to the one we had picked up that morning.

Behind him others somewhat similarly garbed began to appear as though they had come out of the forest. For that fraction of a minute during which a man could count ten no one moved on either side, and then it was for the first time I began to realize the gulf that must separate us.

They were certainly not beings of our own world; they must come from some alien planet, and it seemed almost impossible to find some common method of communication. My own idea of addressing the man on the knoll in English was so preposterous that I dismissed it almost the instant I thought of it.

Had they come in amity or were their intentions hostile? We could only wait and see. I, at any rate, had no intention of taking the initiative, for from what little we had already seen of their powers we could be annihilated before we could lift a hand. For aught we could say to the contrary we might appear to them in the same light that the savage Solomon Islanders did to us, being almost of a lower order.

A slight sound made me cast a glance back over my shoulder. More Stellarites were coming from the direction of the ship; at the same time the others in front began to close in on us, a definite encircling movement to prevent us escaping. Still beyond that they showed no sign of hostility and no weapon was raised, though all seemed to be armed with similar cylinders to that possessed by the man on the knoll. All might have gone well, even then, had it not been for one of our native boys.

At the sight of these grim, blue-clad giants advancing on us, he lost his head completely and like a hunted fox made a dive for the one point where the circle had not yet closed in. Before I could

move a hand one of the Stellarites touched the button of his cylinder. A tiny jet of light utterly unlike the ray Spain had unwittingly released that morning seemed to spring out and touch the native. He stopped abruptly, half-twisted round and sat down—that was how it looked to us—while an expression of intense surprise crossed his face. At least the man had not been killed.

Even then there would have been no further trouble had not Spain, not as fully seized of the position as I was, raised his rifle. Probably he was under the impression that the boy had been murdered in cold blood. But my colleague's finger was still flickering about the trigger—everything you see happened so quickly—when others of the Stellarites, who must have been watching us closely all the time, directed their cylinders at us, and a dozen tiny beams of light struck us.

I FELT something like a douche of cold water spread all over me, and then all feeling left me. I could still see, hear, think and smell, but all power of movement had utterly gone from me. I did not even feel my knees crumple up under me; I only knew that in some curious fashion the ground had, so it seemed, jumped up to meet me. I could turn my head, move my lips and eyes, but that was all. The rest of my body felt paralyzed.

It was an undignified situation in which we found ourselves, the four of us whites and the rest native boys, sprawled on the ground unable to move hand or foot, yet quite conscious of all that was going on about us.

I heard no order given, but some of the advancing Stellarites seized us, the leader descended from the knoll; and we were lifted and borne towards an open port in the hull of the space-ship, for such there was no longer any doubt that

it was. We were taken into some sort of a spacious cabin that in one way reminded me of an operating theatre and in another of a cinema.

A long wheeled table—that was what recalled the operating theatre to me—stood in the middle of the room. I was lowered gently on it, things like handcuffs, save that they had wires attached to them, were clamped about my wrists and ankles and a sort of metal skull-cap was placed on my head. From where I lay I could see something of a white screen at the other end of the cabin, and I found myself wondering what its purpose was. I learnt sooner than I had anticipated.

I heard the click of a switch, and for one dreadful moment I fancied I was going to be electrocuted, for, after all, the metal straps and the skull-cap were hideously suggestive. But nothing happened to me save that the white screen on the wall suddenly grew bright as though a light were shining on it. Then a queer series of jumbled pictures began to pass across it, mixed with flashes of light that conveyed no meaning to me. But presently something in the pictures took on an odd air of familiarity, though there was a vague formlessness about them that puzzled me. At the same time I had a feeling that someone was asking me questions I could not quite understand.

Of a sudden the meaning of the whole thing came to me. These strange folk wanted to know all about us and our world, and this was their method of getting over the language difficulty, some sort of combination I guessed of thought-reading and picture-projection, whose underlying principles, however, I don't think I ever rightly understood.

I had no doubt from the first that my guess was right, for immediately the pictures became clearer, and presently I was able to trace a connection be-

tween them and the thought in my mind. Once I realized that I set myself to work to answer the questions asked of me. I can't quite describe how the questions took form. It was as if something activated a brain cell and swung my mind around to a particular matter. As far as I can make out it was a case—both as far as question and answer were concerned—of turning thoughts into electrical impulses, but, as I say, the process was too deep and complicated for me to grasp the workings of it with any degree of certainty.

PRESENTLY I began to find, too, that I was not entirely at the mercy of my questioners. They could not under any circumstances force me to give an answer if I were unwilling. Once they trenched in some fashion on a matter of which I was reluctant to think; the screen went blank for a moment, then a series of spark-like lights danced across it. But in the main I had no hesitation in opening my mind to their probing. At length they clicked off the switch, lifted me from the table, and sat me down on a seat of sorts to watch the others go through the process.

I don't know what they made of Marian. Her pictures were jumbled and confused beyond belief, and the dominant note in them seemed to be fear. I gathered that she was so anxious about our ultimate fate, that her mind had room for nothing else. They must have realized this, for she was released very shortly.

Arabella, however, must have been a revelation to them. Her projections steadied down immediately—I think she grasped what was going on and set herself deliberately to turn it to her own end—and the weirdest, grimmest farrago of nonsense it is possible to imagine began to parade across the screen. In every picture Arabella her-

self dominated the scene; she invariably envisaged herself as taking summary vengeance on her captors; and her conception of them, as translated into pictures, was perhaps the grossest parody I have ever seen. It would have had its laughable side, but for the fact that I dreaded its effect on the Stellarites. No being, no matter from what planet he hailed, could stand for long seeing his physical proportions, and probably his intentions, so distorted and misrepresented. They got Arabella off the table in double-quick time.

I imagine they were doubtful of proceeding further, for they held a consultation of sorts amongst themselves before they gave Spain a turn. But rather to my surprise my old colleague proved surprisingly tractable, and, once he discovered for himself that there was actually no compulsion about the operation, he loosened up to a remarkable extent. I remember one picture of his shaking hands in a most energetic and friendly fashion with the leader of the party. Certainly it was grotesque, but I think it went a long way towards convincing them that if their intentions were peaceful, so were ours.

At length when the four of us had been dealt with, and we were waiting wondering what next was going to be done with us, the leader of the party put the apparatus on himself. At first, despite the fact that his thoughts were being picturized, we had some difficulty in understanding what he was driving at, but gradually we began to understand that he was assuring us that we would not be harmed—here came a reproduction of that vigorous hand-shaking picture of Spain's—but that he intended taking us with him. The whole demonstration concluded with a picture of us being returned to our own world, and parting from them on terms of the greatest friendliness.

That was all very well, but I had to admit that it dealt with the situation solely from the Stellarites' point of view. It was more than likely that we would not see eye to eye with them in a good many things, and even at that early date I could not rid myself of the knowledge that we were dealing with alien intelligences, who, except superficially, might have nothing at all in common with the men of our own world.

At the very outset two omissions struck me as odd. From first to last we had been given no indication as to what particular planet the Stellarites hailed from, neither had they told us anything about Retallick nor the particular fate that had befallen him. Rightly or wrongly I felt considerably disquieted over this matter.

CHAPTER VII

The Take-Off

LOOKED at in the cold light of reason the situation in which we found ourselves had little to recommend itself. Granting there was a certain allure about a trip into space, there still remained the fact that we were not free agents, and probably could not back out even if we wanted to. I'm certain that Arabella, for one would have given almost anything for the chance of stopping behind on solid earth. Even I was beginning to feel rather doubtful about the outcome.

I am not going to begin by saying, of course, that in the Stellarites we were dealing with superior intelligences. I don't suppose we were; their developments had been along different lines from ours, that was all. Nevertheless, there remained the rather terrifying possibility that they were explorers in a new world, and that, after all, we were only so many specimens to them. Even

if they treated us well, there was nothing of which I could think likely to compensate for the consequent loss of our liberty. For perhaps the first time in my life I developed a certain sympathy with, and began to have an understanding of what must be the feelings of some jungle animal transported from his native home to interest and entertain the millions in a London or New York Zoo. But even such an animal had, with in certain limits, greater liberty than we. It could move about behind the bars of its cage. Our bars were those of the flesh, for at the moment we were still as helpless as logs from the dose of the paralyzing beam we had received. I wondered if it was some sort of temporary suspension of animation meant to make our carriage to another world easier for our captors.

I was, as it turned out, a little previous in coming to any such conclusion. I had barely begun to let my mind play with such possibilities when a hand was thrust behind my shoulders, my head lifted up and a cup of exotic workmanship and design held to my lips. I could only see that it contained some clear green liquid, but it smelt tempting, so I made no effort to resist having it poured down my throat, for that was what actually happened. As I learnt later the ray paralyzed to an extent the muscles of the throat too.

The green liquid tasted rather fine, though it did seem a trifle hotter than necessary. But its actual effect on me was marvellous. I could feel it coursing through my veins, and presently sensation began to come back to my anesthetized limbs. Still, since I wasn't sure that this after all might not be merely some trick of the draught, and I had no immediate wish to put it to the test at the risk of facing a bitter disillusionment, I decided to await developments. They came without any undue delay.

The man whom I had already dubbed the leader of the expedition approached me with what I could only interpret as an expression of anxiety on his face, and made a sign to me. I gathered that he meant me to rise to my feet.

With some little trepidation I decided to take the risk. I found I was quite normal again, save for just the faintest suggestion of the aftermath of cramp in my legs. But that, I suppose, was inseparable from an operation of the sort we had undergone. I looked round and found that the others were rising to their feet, too.

Marian's first action was to hurry across to me and clasp my arm.

"Billy, dear," she breathed, "you're all right, darling, aren't you?"

"As right as rain, little woman," I soothed her. "And you?"

"There's nothing much wrong with me," she said brightly, but, I'll own, big man, that for a few minutes there I was frightened out of my life. But I don't think they mean us any harm, especially that leader of theirs. He seems rather a benevolent sort."

I glanced at the man himself and his eyes met ours. Something I took to be a smile crossed his face. Then, as though the idea had just come to him, he approached us, seized my hand and shook it solemnly in Spain's best pump-handle manner. It was then I realized just how strong a fellow he actually was, and I began to wish that Spain hadn't let his thoughts run away with him in such a hearty manner. Probably he would think the same thing once he had a taste of his own medicine.

THE leader dropped my hand at length and left me ruefully rubbing it. Then he touched his nose with his finger and said something in a clear, not unmelodious voice that I did not

quite catch. It sounded rather like "boko."

"It can't be 'boko,' I said to Marian, "though he did touch his nose, didn't he?"

"Silly," she said, "I think he's telling you his name. Let me try."

She touched her own face. "Marian Harper," she said clearly and distinctly a couple of times, then paused and pointed to the leader with a question in her eyes.

His face lighted up. "Bo-Kar," he said, and tapped himself energetically.

Seeing it was my turn I introduced myself as "Billy Harper," and pointed out the others as "Captain Spain" and "Arabella Spain." Bo-Kar picked it up quickly, and so solved for us one of the difficulties, that of proper names, which I had seen from the first the mind-pictures could not overcome. But the mere thought of proper names brought me back at once to the problem of Retallick.

"Retallick," I repeated a couple of times, and looked about me as though I expected to see the man himself somewhere in the cabin. But for once Bo-Kar did not grasp my meaning and I was at a loss how to proceed until I recollected the apparatus used in the picture projection and pointing to it intimated as well as I could by signs that I wanted to put it on.

Bo-Kar understood at that, and gave an order to one of his subordinates to adjust the gadgets. I learnt then that it was not necessary to lie on the table to use the apparatus; it was probably due to our paralyzed condition that we had been treated in that fashion.

As soon as the straps and the skull-cap were adjusted I concentrated my mind on the matter of Retallick. I gave a mental picture of the man standing guard on the verandah the night before, then switched to my own awakening, my

amazement at his absence and the subsequent hunt for him that Spain and I had conducted. And there I stopped dead, waiting for Bo-Kar.

He merely spoke a sentence or two; my attendant removed the gear from me, and another of the Stellarites moved away from his fellows, where to I could not say. For the moment I fancied my question was going to be ignored. But the next instant a door, I had not noticed before, swung open and Retallick, preceded by the Stellarite I had seen go away, came striding towards us.

He started when he saw us. "Gee," he exclaimed, "what are you all doing here? Have you captured or been captured?"

"The latter," I said, "though I must admit that so far their intentions seem good."

"Oh, their intentions are quite honorable," Retallick said with a grimace; "that is, as long as you don't try to run counter to their wishes. Have they 'third-degreeed' you yet?"

I nodded. "The four of us. I gather they propose taking us off to visit their own particular world, wherever that is."

"Well, we're all in the same boat together," Retallick chuckled. "Though I must say if I'm going anywhere I like to know first of all where it is. This is a genuine space-ship, there's no doubt of that?"

"**PERHAPS**," said Arabella acidly, "instead of indulging in idle speculation, Mr. Retallick, it would be more to the point if you explained to us what happened to you last night."

"Well, there, Mrs. Spain, it seems to me you're asking for rather more than I can give you. All I know is that one moment I was and the next I was not, so to speak. I was standing on the verandah last night; then, in what seemed like a flash, I woke up in broad

daylight, here. My only conclusion is that they stole on me unawares, put me to sleep somehow and carried me off here. Then when I woke up they put that third-degree thing on me and simply milked my mind dry. Gosh, but it was rather weird to see everything one was thinking turning to pictures on the screen there. Once I got the idea in my head that you'd all turn out a search-party to look for me, and I saw you all marching across the screen just as I'd thought of you."

"That's much about what must have happened to you then," I said; "only from the signs you walked here, instead of being carried."

"Then I must have been walking in my sleep," Retallick said with conviction, "for to tell you the honest truth, I haven't the faintest recollection of doing anything of the sort." He chuckled again at the memory.

"It's all very well for you to chuckle," I said, "but the thing that is worrying me is what's going to become of the plantation if we're taken away."

It wasn't the monetary side of it that was worrying me—Spain and I have enough salted away from our various ventures to keep us in comfort no matter what happens—but I hated to see land we had wrested from the wilderness drift back into jungle again. You see, we had no idea how long we would be away and, what was the maddening thing about it, no means of finding out. Also I was rather afraid that the boys, once the restraining hand of the white man was removed, would start fighting amongst themselves.

I was on the point of trying whether there wasn't some way by which I could persuade Bo-Kar to let us go back to the plantation, when we could make arrangements of some sort by means of our wireless; at the very worst we could advise the Commissioner on Tulagi of

our impending and, to an extent, forced absence and ask him to take the necessary steps to carry on, when the Stellar-it himself touched me on the shoulder and beckoned the others to follow him.

Not quite knowing what he wanted, we went after him. He led us through a door—not the one by which Retallick had made his entrance—into something that I can only describe as an observation room. Shutters in the side of the ship must have been slipped back, revealing windows of some substance strange to us, through which we could see the jungle surrounding us, and, far away over the tops of the trees the galvanized iron roof of our bungalow sparkling in the sun.

As I stared about me it suddenly struck me for the first time what the work was, which the red beam had been doing the previous night. Through some cause not yet apparent to us, the ship had been forced to descend in the jungle, and the beam had been used to cut the trees and undergrowth away to give it free space in which to rise. The fact that for one instant as it was being swivelled around the beam had cut a path through the forest and narrowly missed the bungalow was due to the veriest accident. It was more or less obvious they had not done it with any deliberate intention.

I WAS at a loss to know for what precise reason we had been brought to the observation room, for it certainly could not be merely to look out through the windows. But almost before I had managed to express them in my own mind, my doubts were solved. Bo-Kar pointed to a sort of pedestal arrangement in the middle of the room. The pedestal stood about four feet high, was circular in shape and had a sort of basin-like depression on the top of it. The interior of the basin was covered with

some sort of silvery substance that had a curious quality of seemingly being in flux.

As we stared over each other's shoulders something began to take form in the basin. At first I had some difficulty in recognizing it, then I saw that it was a small but exquisitely clear panorama of our island. I could see the bungalow; the schooner at anchor in the bay; the jungle, and even the square of cleared ground on which the space-ship rested, looking like a tiny dark patch.

A jerk nearly threw us off our feet; we clutched at each other for support.

"What was that?" someone asked.

I did not answer, though I had a queer sinking feeling at the pit of my stomach. Instead I leaned over the basin again. The island was now no more than an olive green blot set in a sparkling sea.

With some glimmering of what had happened I rushed to the side-windows. The others followed. I think they, too, were beginning to guess. Instead of the massed jungle that had surrounded the ship beyond the square of cleared ground we could see only empty, blue sky, and, as if to confirm our worst fears, at that exact moment there came another jerk, and the ship seemed abruptly to shoot higher.

There was no longer any doubt about the matter. We had been kidnaped in the most bare-faced manner possible, and the earth that had been our abiding place was already dwindling rapidly away beneath us.

CHAPTER VIII

The Voyage

WE would scarcely have been human had we not felt alarmed. From the start it was quite obvious that this was going to be no

mere pleasure trip through the atmosphere of our own planet; the abrupt vertical rise of the ship, no less than what the leader of the Stellarites had attempted to convey to us by means of his mind pictures, showed us that.

For the space a man might take to count ten the full realization of this, dawning on us, held us mute and still. It was Arabella, at length, who broke the silence and who first shook the fear from herself. What she had to say was not nice; even at the best of times she had an acid tongue. Now she directed the full force of it on me.

I am not going to repeat in full what she said, but the gist of it was that our present plight was due entirely to my foolhardiness. Had I not persuaded Spain into rushing off that morning in search of Retallick, we would not be where we were at present. More on the same lines.

"Don't be a fool, Arabella," said Spain, catching her hand as she paused for breath. "You know as well as I do, that if we hadn't come to them, they'd probably have come to us. It's six of one and half a dozen of the other. If you'd been in Billy's shoes you'd have done exactly as he did."

"I wouldn't have walked blindfold into a trap," she declared.

"The fact remains that you did," her husband pointed out. "You didn't see any further ahead than the rest of us. Anyway, we'd no grounds for believing at the start that they could have taken us over so easily. Still they did and we have to make the best of it now. I, for one, don't feel very uneasy about it. They seem a pretty decent lot, and, barring the fact that they've taken us off with them without giving us a chance of saying 'No,' they haven't shown any sign of ill-treating us. What you're windy about—and that applies to all of

us—is the fact that we're doing what human beings have never done before."

"I'm thinking of the plantation and the island, too," said Arabella. "By the time we get back, if we ever do, the whole place will have gone to rack and ruin."

"Oh, let the plantation rot for all I care!" said Spain sharply. "We've a chance of doing what lots of men would give their eyes for, and I'm in favor of saying let's make the best of it. What do you others say?"

"That's about the size of it," I agreed. "I'll own I've made a number of tactical mistakes, but at the same time you have to admit we were dealing with conditions utterly alien to us, and I couldn't be expected to foresee everything."

"Oh, nobody's blaming you so much," Arabella cut in, though she had said just the opposite a few minutes previously. "If you're going to get any enjoyment out of a situation like this, that's your own affair. But for my part I feel safer with the good hard earth under me. Human beings weren't meant to go flying about in the heavens like shooting stars."

Of course that was just the sort of argument that every opponent of progress has used since the days man first got tired of walking about, and began to look for some quicker means of progression. Quite probably when the first wild horse was broken to saddle and bridle, The Old Man of the Tribe had said much the same sort of thing, and his pessimistic descendants down through the ages have kept harping on the same string. I could have pointed all this out to Arabella, but in the interest of general peace I decided that the less said about the matter at present the better.

Presently the windows through which we had been looking were obscured and then closed altogether, so that we were

left for a time in practically total darkness, until a light not very different in quality from the sunlight, as we knew it, began to fill the room. I looked about to see where it was coming from, but failed to locate anything in the nature of a bulb or tube. It was quite a while before I learned the method by which the light was diffused.

What had happened to the windows was obvious. They had been closed by some sort of port and probably the whole ship had been hermetically sealed. Certainly when we were leaving the earth's atmospheric blanket and heading out into the cold of inter-stellar space. What had puzzled me from the start, though, was the gentleness with which the ship had risen through the air. Somehow the sight of the rocket tubes, not unlike those of Goddard type, that were clustered about the nose and tail of the ship, had given me the idea that by their means we would be shot off the earth at something like the initial speed of seven miles a second necessary to overcome the pull of the planet's gravitation.

BUT presently as I turned the matter over in my mind I saw that such was not the case. We had risen too smoothly for anything of the sort. Our Stellarite friends then must have discovered some method of nullifying the pull of the planet, and were in all probability using some sort of gravity screen. The considerations which had prevented it from being put to practical use are, however, no concern of this narrative.

It was now, as we began to climb into space, that I felt the first kick of the rocket explosions, and the ship began to jump ahead as the reaction gases got in their work. That much, the principle underlying it, I could understand: the work of Goddard in America, and of a number of experimenters in Germany, had made me familiar with the idea.

So far—long as I have taken in the telling of it—I doubt if ten minutes altogether had elapsed from the moment we realized we were rising to the time when the window ports closed and the stellar ship swung out into space toward the stars. Bo-Kar still stood silent and close by us watching our expressions, as if thus to read our thoughts. But now, a second or so after the light came on in the cabin, he signed to us to follow him. Since there was nothing else to do, we obeyed. He led us down some sort of a corridor, brightly lit as day, and stopped at last in a passage not altogether unreminiscent of the alleyways in a liner's living quarters. A door on each side of the alleyway stood open. He pointed first to one and then to me, and in the same way bracketed Spain and the other door.

No doubt he was indicating that these were our quarters—cabins, if you will—but since I was not sure whether he meant to separate us from our women-folk, I took the bold course of bringing the matter up then and there, so there should be no mistake about it. I drew Marian towards me and indicated as well as I could by signs that I expected her to accompany me.

Bo-Kar grasped my meaning at once; his face brightened, and he made what I took to be a gesture of assent. The next instant, whatever faint doubt we might still have left of his meaning fled altogether, when he saluted us by raising his hand to his forehead, palm outwards, then beckoned to Retallick to accompany him, and turned away. I had the curiosity to linger a moment at the door of our cabin and watch the retreating figures. Retallick, to all appearances, was given a cabin further down our alleyway, for I saw him turn and enter a door there, and after a second or so Bo-Kar came back alone, giving me a smile as he passed.

I WENT into our cabin and looked around. It was small, though no smaller than one would find on the average passenger ship, but the queer thing was that there were neither beds nor sleeping berths, such as we had expected to find. Instead on the floor was a pile of soft and luxurious cushions.

"I suppose," said Marian, "we're meant to sleep on those, but, Billy, whatever are we to do without bed-clothes of any sort?"

I stared ruefully about me. There didn't seem to be anything that would answer the purpose.

"I guess we'll have to do what these birds do," I suggested. "They don't seem to need them, so it looks as though we'll have to put up with it. At any rate they've done the decent thing by giving us a cabin where we can have some sort of privacy."

"Well, we won't have it, you know," Marian said gently, "as long as you keep the door open. Arabella has already shut hers."

I noticed that, and I wondered why. The natural thing, I took it, would have been for the four of us—five, if one thought of Retallick—to hold some sort of conference amongst ourselves the moment we were left alone. As I found out pretty soon, however, it was more by accident than design that the other door had been shut.

At first I could not find any mechanism that looked as if it would function. There was neither lock nor handle on the door, and the thought struck me that perhaps it was operated by machinery with which we were unfamiliar. I satisfied myself, however, that the door worked on some sort of a sliding principle instead of hinges—it had been folded against the wall when we had entered—and presently as my fingers explored its surface I must have touched some knob or similar inequality, for of

a sudden it slid to, gently and without a sound.

The cabin was lighted by an upright tube of glass-like substance that was fixed high up on the wall, and from which a light, like that of subdued sunshine, streamed, and filled every nook and cranny of the room, so that I was able to see what I was doing. A further exploration of the surface of the door revealed what I wanted. Two tiny little buttons, more like flat discs they were, the one red and the other white, were fixed close together where normally one would expect to find the handle.

I pressed the red disc. Nothing happened. "Wrong one," I thought, and touched its white companion. The door slid gently open. Again I pressed the red disc, and the door closed. It was a small thing in itself, but the mere fact that I had discovered of my own accord how to open and shut the door, the further fact that I could open and shut it as I wished, had a considerable heartening effect on me. It made me feel that we were not exactly prisoners after all.

I turned to find Marian regarding me with eyes brimming with questions.

"Well," I said, taking the initiative, "how do you feel about it?"

"About all that has happened?" she said. "Billy, I hardly know what to think, it's all so wonderful and strange . . . and . . . and queer. If we weren't together I would worry, but, so far, from what we've seen, they seem inclined to treat us well."

That was much how it appeared to me. How long that would continue though, of course, we couldn't say. Up to date, allowing for the fact that we had had no option in the matter of accompanying them, the Stellarites had shown us quite reasonable consideration, and seemed to acknowledge that we were beings on more or less the same plane

of intelligence as themselves. If there was any ground for alarm at all, it had not yet begun to manifest itself. Nevertheless I could not rid myself of the uneasy fear that ultimately it might prove that we were no more than queer zoological specimens to them.

"Look here, Marian," I said soberly, "everything seems all right so far, and I don't think we have any reason to start worrying, but it's just as well to keep in mind that we're no longer on our own planet and dealing with people with whose customs we are more or less familiar. Until we understand exactly what's what, I fancy we had better go cannily. Possibly these Stellarites are utterly alien to us in every way, and if we're not careful we may all unwittingly offend them."

SHE nodded. "That's what I've been thinking, too," she said. "Oh, I'm not worrying about ourselves, only Arabella. She's so used to having her own way in everything and riding roughshod over opposition that you never know what trouble she may start. Then there's her tongue. Luckily they don't understand us yet, but once we reach some sort of common basis of language, as I suppose we will sooner or later, she's bound to say something she shouldn't."

I frowned. Arabella, of course, was our one weak spot, and the fact of that could not be impressed on her too soon.

"I'm inclined to think, Marian," I said after a moment's thought, "that the best thing we can do is to hold a council of war on the spot. I'll get Spain and Arabella to come over here at once. But how about Retallick?"

"He'd better come, too," Marian suggested. "He's all right, level-headed, I mean, but I think it's only proper he should know what we decide to do."

"All right. I'll call the others, then,"

I opened the door and, crossing the alleyway, knocked on the Spains' cabin door. For the moment there was silence, then Spain's voice came to me.

"Who the devil's that? What do you want?" he demanded huffily.

"It's only me, Billy Harper," I said. "We want you two to have a talk."

"That's nice of you, but how am I going to open this damned door? It seems to have shut itself and I can't find any way to make it work."

So that was it, then. But I was able to remedy the matter for him. The outside of the door was provided with similar discs to the inside, so I pressed the proper one. Two relieved faces peered out at me.

"How did you do that, Billy?" Spain queried. "Have you got a key of sorts?"

"You don't need keys here, evidently," I told him, and, stepping inside, showed them how the discs worked.

"It isn't Christian," said Arabella tartly, "all this opening doors without keys."

I couldn't quite see what Christianity had to do with it, one way or the other, but since I wasn't anxious to start unnecessary arguments—we would have enough of the other sort soon enough—I held my tongue.

"Well, never mind that now," I said soothingly. "You two go over and talk to Marian while I hunt up Retallick."

I had no trouble at all in locating our manager's cabin. It seemed to be the only other one up the alleyway, for the opposite wall was blank and the alleyway itself ended in a cul-de-sac a few feet further on. Retallick had made no attempt to shut his door, it seemed, for at the moment it was standing open, and the man himself was surveying the interior of his cabin with an expression that failed to reveal what his real thoughts were.

He turned round quickly at the sound

of my footsteps. "Oh, it's you?" he said. "What's the latest news?"

"None," I told him, "except that we're going to hold a council of war and want you along to join it."

He looked at me oddly. "If you care to call it a council of peace, Harper, I'm your man," he said deliberately. "Otherwise, no."

I saw what he meant. There was a good deal of wisdom in the idea, too. That he had already threshed the matter out with himself and arrived at this conclusion, showed a soundness of judgment that made me feel his level-headedness might yet be of considerable value to us.

"Call it anything you please," I conceded, "but come along. We won't quarrel over that, I'm sure."

CHAPTER IX

The Voyage, Continued

WHEN we were all gathered together in our cabin and the door closed, I opened the ball.

"I don't know whether we're likely to be overheard here," I remarked by way of preliminary, "but I don't suppose it matters much anyway. For one thing they can't understand what we are saying, and for the other, even if they could, it's nothing it would hurt us for them to know. On the contrary, probably. The situation as it seems to me narrows down to this: We've been kidnaped, and we're sailing off to God knows where in interstellar space. If you can apply the same rules of psychology to these chaps that you can to the bulk of mankind I'd say that, as things are, we seem to have little or nothing to fear from them. On the other hand, as I've already pointed out to Marian, we'll have to watch out that we don't tread on their corns. It's always good policy to respect the local

prejudices, though I'll admit it's made a trifle difficult when you don't know what they are. But then that's all the more reason why we should take care."

"So far so good, Harper," Retallick interposed. "I agree with you there. But what I'd like to know is why we've been taken off in this fashion. Any-one any suggestions to offer?"

"I have," I said, "and you can take it for what it's worth. When we whites started reaching out across the earth to the new world, the first thing we did was to bring back specimens for the home-folk to see. Columbus took back Indians to Spain with him."

Retallick grinned ruefully. "If I were you," he said warningly, "I wouldn't push the analogy any further. We whites can't altogether pat ourselves on the back over the way we treated the peoples we discovered. I wouldn't like to think we were going to be dealt with by these chaps the way the Spaniards treated the Indians, or the way our own English folk treated the blacks in Tasmania, to name only two instances. However, from what little we've seen I think we can hope for something better than that. Continuing, is there anything to indicate where we are heading?"

We looked blankly at each other at that, and I thought of Spain's calculations based on those calls we had heard the previous night. Of course he had Mars in his mind at the time, and though his calculations were wrong, I was not sure but that his instinct had been right. After all, the Stellarites might have been exchanging messages with another ship of theirs twenty millions miles out in space.

"I wonder," I said thoughtfully, "if you others have noticed anything different since you've come aboard?"

"In what way?" asked three people together. Retallick merely smiled and waited.

"Have you been feeling any" lighter, say, or perhaps a bit more energetic? Look." I caught Marian in my arms, and, a thing I could not have done on earth, swung her up over my head, holding her there. She gave a frightened little cry as I released my hold, but instead of falling plump she came down lightly—almost fluttered down.

Retallick nodded. "That's absence of gravity," he said. "We're beyond it now, in free space."

I shook my head. "Not exactly," I said. "If it was merely that, we'd be floating about, and so would everything else not fixed to the floor. You see, there's still gravity of a sort, but we're lighter—or stronger; it amounts to the same thing—than we were on earth. We're dealing with different gravity conditions, and it's my belief that this ship is adjusted to the conditions these Stellarites are used to. Which, of course, would be the gravity of their own planet. As we feel lighter and can move with a greater ease and freedom, it follows that their planet is slightly smaller or lighter than our own earth."

"At a guess then," said Retallick, "there are two planets, from either of which they could have come, Mars or Venus."

"That's about my own idea of it," I said. "At the same time there are other possibilities we should not altogether ignore. Though it isn't very likely that they have come from beyond our own solar system, or they may belong to Ganymede."

"Ganymede?" said Marian quickly. "Where's that?"

"One of Jupiter's satellites, the largest of them. It's a little larger, I fancy, than Mercury, less than Mars. But, as I say, these are outside possibilities. I think you'll find, when we're able to communicate properly with them, that

they hail from one or the other of earth's neighbors in Space."

"**A**S purely speculative matter I've no doubt that what you have been saying is very interesting," said Arabella with a grim fighting twist to her mouth, "but I can't see that we've got very much further forward so far. What I'd like to know is how are we to set about getting out of here?"

"We're not," I told her with something of her own decision, "and it wouldn't do any good if we could. It's not simply a case of trying to escape from the ship and heading back to earth. We're out in free space now, with a temperature near absolute zero around us. If it wasn't that the ship is insulated against extremes like that, we'd be frozen solid. But even if we could manage to capture the vessel I can't see what good it would be to us. We don't know the first thing about handling any of the machinery on board. My main idea in calling you all together here was to ensure that none of us did anything that would cause trouble. I don't think I can repeat that too often. That, however, isn't to say that we're not to keep our eyes open and learn all we can."

"Much good it will do us," Arabella snapped, "if we're going to be cooped up here until we reach wherever we're going. Tell me, what is the distance between earth and Venus."

"Anything from twenty-five million miles to one hundred and sixty million miles," I told her. "You have to remember the distance isn't constant, as neither the earth nor Venus is fixed in space. They're both moving round the sun on their own orbital paths, and each at its own rate of motion."

"And Mars?" she said thoughtfully.

"At its nearest forty million miles."

The distances seemed to stagger her, as they do stagger anyone used only to

thinking in terms of earth travel. For the first time I believed that she began to realize something of the immensity of space, and the gigantic achievement of these beings who had bridged the gap between their world and ours. The realization of all this rather subdued her; I know that from then onwards her awe of the Stellarites steadily grew, though it seemed that nothing could prevent her from giving free rein to that vitriolic tongue of hers.

"It amounts to this," Retallick remarked at the end of a pregnant interval of silence. "We can't formulate a plan of campaign, for the simple reason that we don't know what we're up against. We can't plan to escape, because we've nowhere to escape to, and no way of getting there if we had. Seems to me our function for the present is purely ornamental. By the way, talking of ornaments, where are our boys?"

As a matter of fact I hadn't given them a thought, though one of them had been the proximate means of our capture. I had assumed that they were being treated as well as we were, though now Retallick raised the question I began to have my doubts.

"It looks to me," Spain suggested before I could answer, "as if we should find out. At any rate it will give us an excuse to wander about, if we need one."

The rest of us assented to that, mainly because anything seemed better than the forced inaction of being pent up in our cabins. I was turning, on the point of leading the way out, when Spain spoke again.

"**B**Y the way, Billy," he said casually, "are you still armed? I know they've taken away our rifles and that tube of theirs we found, but they left

me my revolver and I thought they may have done the same with you."

They had. I was so used to wearing it that the fact that it was still in its holster had not forced itself on my attention.

"Good," he said, "then if the worst comes to the worst, we have arms of a sort, two out of the five of us, that is."

"You're not thinking of using them, surely?" I asked.

"N-no. But the knowledge one is armed gives one a sort of comfortable feeling, doesn't it?"

I couldn't quite subscribe to that idea. I saw too many possibilities ahead to feel comfortable in that sense. But as things turned out, Spain wasn't so far wrong after all.

Well, we went down our alleyway, and at the intersection we received our first unpleasant surprise. Seemingly there was not a soul about, but as we reached the cross passage a young Stellarite stepped forward quickly from the shadows, and barred our way with leveled ray tube and a gesture that said, as plainly as so many words, that we could go no further.

He seemed younger than the few we had so far come in contact with, and he was dressed differently. His tunic, which reached almost to his knees, was of a bright electric blue, in striking contrast to the duller tones of his associates, and it bore on the breast some intricate golden design that I could not make out. Also the tunic was cut a trifle lower at the neck.

A smiling, pleasant-faced youngster, I thought, with eyes that danced, one who moved with an easy gracefulness that it pleased the eye to see. Not an unpleasant people amongst whom to cast one's lot if there were many more like him.

But despite it all he would not let us pass. On that point he was adamant, and when Arabella attempted to thrust

her way forward, the ray tube was turned in her direction in no uncertain manner, and the smile changed to a threatening frown.

She muttered something under her breath that I did not catch.

Retallick, alone of all our party, did not seem in the least put out. True, for the moment he looked as taken aback as the rest of us; then his expression changed and his dark eyes danced, and at that I saw the smile come again into the Stellarite's face. But even that availed him little. The young man was playing no favorites. He pointed back towards our cabins, and signed us to return. Then, since there was nothing else to be done, we turned and dragged our way back.

Again I heard Arabella mutter to herself, but this time I fancied I caught her words.

"The hussy," she muttered; "the brazen hussy!"

"The which what?" I said quickly.

Retallick turned on me. "Didn't you notice, Harper?" he said. "Lord, you must be blind, man. Our guard's a girl, and a little peach at that. If there's many more like her on the planet, we're going to, the trip won't be so bad after all."

CHAPTER X

Developments

IT was the first definite intimation we had had that we were being kept under guard and that our movements were to be restricted to our own quarters, and as such it had a damping and depressing effect on my spirits. Unfortunately I was not able to view the new development in the same favorable light as did Retallick, perhaps because I have passed the impressionable age. Indeed, the mere fact that our particular

guard was a girl gave me a totally new idea of our captors.

Of course it may have been merely that I had some of the old-fashioned prejudice against employing women in any sphere we usually look on as peculiarly a masculine one, but somehow the knowledge that one girl at least was included in the complement of the ship, made me regard the Stellarites as less human. It did not occur to me that in this particular, as in others, we might find their customs totally at variance with ours. Naturally, it should have occurred to me, for I had already warned the rest of our party that we were dealing with alien folk and alien methods of thought. Still I am not defending my own particular lapse; I merely record the fact of it.

We were not left entirely to ourselves. At stated intervals food and drinks were brought to us. The liquid was a green stuff similar to that with which we had already made acquaintance, and it seemed to possess remarkable energizing properties. The food, however, was served in the form of tabloids. To our minds it lacked taste and substance, and I would have given much for a good square earth meal. None the less it was sustaining enough. It transpired later that when on their own planet the Stellarites partook of their food in its natural form; it was only when on long inter-planetary trips that, for a variety of reasons, one of which was economy of space, compressed food in the form of tabloids was used.

Some time in the afternoon of that same day, as well as we could judge, we received our first visitors. Bo-Kar, the girl who had been on guard, and a dignified elderly man with an Aztec type of countenance, called on us, and made us understand we were to follow them.

We did so with some degree of trepidation, for, since our encounter with

the girl earlier, we had all got the idea into our heads that our fate hung in the balance. The room they took us to, however, was not one of those we had been in before. It was small, just big enough to hold us all comfortably. Things that I took to be maps were arranged at intervals around the walls, and in between were shelves containing articles remotely suggestive of scientific instruments. One of the shelves held what at a glance looked like books.

We were invited to seat ourselves on the floor on cushions supplied for the occasion, and the elderly person took charge, Bo-Kar and the girl at first watching with interest. The Stellarite began by indicating to us that his name was Thrang, and getting us to repeat our names in turn. He said them after us, making a rather unsuccessful attempt to imitate our accents.

He seemed rather puzzled by something, though, and, turning, made some remark to Bo-Kar. I fancy it was a question, for Bo-Kar merely nodded. Thrang then turned to us and spoke a sentence or two. At first I had no idea what he was saying, but there was an odd, familiar ring about some of the words that puzzled me. It was Spain, however, who solved the mystery for us.

"Good Lord," he said, "he's talking a sort of debased Malaysian dialect. I can't follow it except for a word here and there."

For the moment the news staggered me. It seemed too patently impossible to be true. Then my mind flew back to that last talk I had had with Narada when, under the mellowing influence of our whisky, he had given me the reason of the unrest in the compound. Could it be that the native legend was right after all; that the story referred not to the early Spanish settlements in the Solomons, as I had imagined, but to a visit from a space ship? It seemed now

that it did, in which case there was a ready explanation of Thrang's knowledge.

The Stellarites, or some of them, had learned the particular dialect of the men they had taken; it had been handed down through the years, and now they were trying it on us, possibly in the mistaken belief that it was our own tongue. In the interval, of course, the dialect had changed; the Malayan folk had no written records or anything to fix pronunciation save local usage, and what we were hearing now was the language as spoken in the Solomons five hundred years before. The whole vista of suggestion it opened up was a remarkable one, not the least the painstaking carefulness that had made the Stellarites preserve their knowledge of the dialect through the centuries in anticipation of another visit to earth.

SPAIN," I said, "you know a bit of the Malayan talk. I don't. Try your hand at it, and give him to understand that it is not our language but that of our servants."

"I'll see what I can do," Spain said, "but it's rather like an Englishman of Chaucer's day trying to hold a conversation with one of us. The accent's all different and some of the words seem to have altered their meaning. However, I'll have a stab at it."

He did. After an interval Thrang, speaking slowly and with rather a puzzled expression on his face, replied.

Spain brushed the perspiration from his forehead and then ran his fingers through his iron-gray hair. It looked as though he was making heavy weather of it, and Thrang appeared to be in much the same state. But at last, after a few more labored exchanges, Spain turned back to us.

"We're getting somewhere," he said, "but the trouble is that we're using as

a medium a primitive language that is immensely overworked as it is, and that doesn't possess the words we need to express anything in the nature of an abstraction. It seems though as if Thrang is rather surprised that we have more than one language on the earth—I gather that he regards it as a relic of barbarism. He suggests, however, that in order that we may have some sort of intelligent converse we should learn his language, and we're to teach him what we can of English. If we agree we'll start right now."

"And if we don't?" I queried.

"I'm not anxious to try," he said significantly.

"I, for one, positively decline to go back to school again at my age; that's what it amounts to," Arabella declared.

"Don't be a fool," said her husband. "You don't want to get us all into hot water, do you? Because, if you do, you're going the right way about it. I'll tell Thrang we'll be delighted. I think that will please him, for he seems to have a high opinion of his own ability as a teacher."

It did, for he broke out in a rash of smiles, then translated the news to Bo-Kar, who also looked pleased. The girl eyed us thoughtfully, I imagined, and it struck me that perhaps after all she was the sharpest of the three when it came to reading people's minds. She said something to Bo-Kar—I could not say from the tone what it was—and gave a little gesture of her head toward us. Whatever it was she apparently got her wish, for a self-satisfied smile flitted for an instant across her face.

That was that, then. With another word or two to Thrang, Bo-Kar went out, leaving the girl behind. She sat down facing us, her ray tube dangling from her hand in what I thought was a significant attitude. But we speedily forgot the tube, though the girl herself was

harder to shut out of one's appreciation.

Looking back now I think those hours we spent in that room were quite the pleasantest of my life. I have seen and learnt much since, but nothing I had ever come across could have convinced me beforehand that the process of education could possibly be so fascinating.

Thrang began by taking down from the shelves one of the things I had remarked looked like books. So they were. But not books as we knew them. They were more a sort of talkie film, if one can put it that way. Figure for a start a book placed on its side. The upper surface was composed of some sort of opaque, white glass, and what then became the sides bristled with little knobs and buttons. Thrang touched one of them; the white glass glowed and spread across its centre appeared a string of characters that I assumed to be the title of the book. At the same time a voice, seemingly coming from the book machine, spoke slowly and distinctly.

OUT of the corner of his eye Thrang watched the effect on us. I fancy from what I know now that he was trying to gauge the measure of our intelligence, our particular receptivities, so to speak. I can hardly imagine that he was disappointed.

I have no intention of describing in detail the course of our schooling. Sufficient to say that it turned out to be a far more interesting process than I could have believed possible. The system was simple in the extreme. In the elementary stage, wherever it was possible, everything was illustrated, or rather appeared on the screen of white glass. Of course we were handicapped to a great extent when it came to envisaging abstractions, but that no doubt was due merely to the fact of our adult mentalities. After all, every child learning to talk starts with an absolutely blank mind; it picks up the

language from hearing those about it speaking, and, by the time it is old enough to learn the principles of grammar and to realize what abstractions mean, it has already unconsciously absorbed most of them. If we were handicapped at all, it was by our anticipation of difficulties that disappeared as soon as we came to them.

The days passed, and our vocabularies grew. In a surprisingly short space of time we could carry on limited conversations, and from that, by easy stages, progress to the point where we were able to learn something of these strange beings in whose power we were.

The revelation, when it came, was not so staggering as it might have been. You see, we had been gradually working up to it, and from time to time a glimmer had been vouchsafed so that, when we were able to formulate the questions that had been troubling us, we had guessed at least some of the answers.

It was early on that day we learnt that the ship was headed for Mars, and that our Stellarites were actually Martians. They had another name for their planet. Roca, they called it, pronounced as nearly as we could get to it, "Row-ka."

From the very first a good many of our popular earth ideas of the Rocans and their world went by the board. It was not, as our astronomers believed, a dying world, though one can hardly blame them for falling into that error. It was merely that they were looking at everything from an Earthman's point of view, and taking it for granted that conditions on the two globes were more or less analogous.

As our lessons progressed and our understanding of Rocan improved, Thrang and I got on quite friendly terms. He seemed rather disappointed when he discovered that I was not a scientist, but merely a common or garden self-educated citizen of the world, and when I

informed him that such scientific knowledge as I possessed had been gathered by means of a fairly wide but haphazard course of reading, he stood aghast. It was only gradually that I managed to make him realize that practically all kinds of scientific research were conducted by enthusiasts and that it was almost impossible to get finance for anything of the sort unless it could be shown at the outset that it had an ultimate commercial value.

I will not repeat what he said. As a citizen of no mean planet it rankled for quite a long time, though I soon enough came to see that old Thrang's shocked surprise was not so very remarkable after all. It is our attitude toward things that will make our world a better and happier place to live in that in retrospect seems so odd.

I WOULD I had the space here to give some idea of the history of Roca, or as we still called it in our own thoughts, the planet Mars. Even the sketchiest outline would fill a library of volumes. It is the record—at least during the last few centuries—of the striving against almost superhuman odds to make a paradise of a world not so well endowed by Nature as our own, a struggle that had ended within the memory of Thrang himself in ultimate and unqualified success. But the greater part of what had been done he would not tell us, but left it for us to see for ourselves.

When I expressed for the first time the general doubt that existed amongst men best qualified to know as to whether the planets other than earth were inhabited, he stared at me as though he could not believe his ears, and then had me repeat my statement before he could be sure he had heard aright.

"Does man on your world then think that, out of the whole of the universe, his particular planet has been specially

favored?" he asked. "Is it just blindness or egotism that prevents him from seeing that there are worlds other than his own, with life somewhat similar to his on them?"

"Neither," I said promptly. "It's mainly due to insufficient scientific equipment and general lack of interest in anything beyond our own borders. But tell me why, if you may, your people should have torn us so unceremoniously from our planet?"

It was perhaps the first time the question had been put to him in that form. Hitherto I imagine every Rocan had fancied that they were doing something fine and noble in carrying us off to view a civilization so vastly different from our own and, if what we were told could be believed, so immensely superior to it. It was an attitude I could understand and make allowances for. We, in our dealing with subject races, suffer from much the same sort of superiority complex.

I made him understand, however, with a good deal of difficulty that we had not been altogether willing parties to our taking off, and that probably our own particular concerns would suffer through our absence.

"In what way?" he wanted to know, so I spoke of land wrested from the wilderness being over-run again by the jungle, of plantations rotting for want of attention, of native boys, tamed and subdued and trained to work, slipping back once more into the evil ways of savagery; and lastly, but not leastly, I touched on the monetary aspect of the matter. He seemed to understand that, so I concluded that the Rocans, with all their virtues, were not strangers to the advantages the amassing of wealth brings in its train.

He brushed my anxieties aside with the assurance that we would be amply compensated for any loss of that sort

we sustained, and he gave me a hint—whether or not it was official I could not say—that his people would, if we met with their approval, make us acquainted with arts that would give us supremacy in our own land. It sounded alluring enough, though I preferred to await developments before I passed an opinion.

TWO things that had puzzled me hitherto were made plain once the language difficulty had been overcome. I could never understand before why the Rocans, seeing that they had solved the secret of interplanetary travel centuries before us, had not come to earth sooner and in greater numbers. Then, too, I often wondered why they had gone to the trouble of teaching us their language, when it looked as though the picture machine would work just as well.

Thrang explained away my latter difficulty first. The picture machine was good in its way, he said; but it had its limitations. For one thing the apparatus was fairly cumbersome. Also the same thought did not always express the same picture even in two minds more or less attuned. For example he took "Lulor," the Rocan word for book. To me it connoted a bound and printed volume; to him it meant the portable film thing we had been using. The latter I could only conceive as a sort of miniature talkie. The result was that my mind cast on the screen a distorted conglomerate picture formed of mixed conceptions altogether unintelligible to the Rocan mind. Once he started me on the way I could carry the analogy further. "Book" to a literary man means something altogether different from what it means to a racing man, and so on. Earth to me, again, even when I used the Rocan word, conjured up a picture of wide blue seas, clear blue skies, bright

sunshine and drab olive-clad islands—to Thrang it appeared as a small green planet far off in space. Neither of us would have recognized the other's mind picture as being the same thing viewed from different angles.

And as for interplanetary travel. . . . Well, there was that trip made nearly five centuries before, when some of the islanders had been taken from their native earth. It had been a pioneer trip; it had meant privation after privation for the daring voyagers, and they had just managed at the last to limp home more dead than alive. For some reason or other the gravity nullification apparatus had not worked very well, and instead of improving it, the system had been discarded in favor of rocket-ships relying on their power of acceleration to get clear of a planet's gravitational attraction. Some had worked reasonably well over short distances; others had shot themselves off into space, there to perish miserably. Yet they kept on experimenting.

"Why didn't they revert to the gravity screen?" I asked.

The secret of that had been lost in the intervening centuries, Thrang told me, and it was not until about thirty of our years ago that they had succeeded in rediscovering it and applying it in conjunction with the rocket system. A ship had then been sent off to the earth; it had hit somewhere in our northern hemisphere, and that was the last that was heard of it. Rocan astronomers had reported a burst of flame about the time the ship should have arrived, so it was surmised something had gone wrong with the apparatus; that it had been unable to decelerate in time and the friction of the earth's atmosphere had vaporized it, or else that it had been destroyed by the force of the impact.

"When was this?" I asked, as an idea struck me.

THRANG did a brief calculation, and told me the result. Nearly twenty-two years ago it would have been. Then most likely the so-called meteorite which fell in a wooded Siberian valley on the morning of June 30, 1908, and destroyed the forest for fifteen miles or so around, was the luckless Martian spaceship.

Thrang agreed with me when I told him of this. The fact that no traces of the ship or its complement had ever been found was doubtless due to the force of the impact; the great heat generated would have incinerated everything for miles around.

After the lesson of this tragedy, however, the scientists began to forge ahead, and finally two years previously had perfected the device that rendered them independent of the rocket tubes in taking off and alighting. The tubes now were merely used for obtaining acceleration in space, working on the reaction principle already embodied in Newton's third law of motion.*

The method of nullifying or rather rendering partially inoperative the local conditions of gravity, as I had surmised, was achieved by passing the necessary magnetized currents through the desired portions of the shell of the vessel. In a somewhat similar fashion the Martians on landing had countered earth's greater gravitational effect on them by wearing specially prepared shoes with a wire-mesh sole through which the current had been passed. It was the tracks left by these shoes that had puzzled us on the morning we had gone in search of Retallick.

"I do not think," Thrang added with a smile, "that you will need any such device on our planet. You will find there less gravitational pull than you are used

to, but this ship is already adjusted to our conditions, so it will not feel strange to you. That is the advantage of coming to a smaller planet."

Many other things, he told me, which were strange to me, and some of which, by reason of my lack of scientific knowledge, I failed to understand.

And so the days passed, and soon, through the observation window opened up in the forward part of the vessel, we were able to see the planet Mars grow from a small red disc to a great orange globe that presently began to fill the sky.

CHAPTER XI

The Peril in the Void

YET despite their friendliness, their attitude of benevolence and their apparent willingness to explain to us everything that we found new and strange, I was never quite at my ease with the Martians. Always there seemed to be between us some barrier that nothing we could do would remove.

In the beginning I put it down to the fact that we were making contact with a race more alien to us than any race on earth could ever be, alien to us in thought, language and customs, alien perhaps even in origins, certainly in civilization and all that makes for intercourse between nations. But even when this feeling began to wear off, the other—our distrust—still persisted.

It was more an instinct than anything else, that distrust without reason, which more than once, in a by no means uncheckered career, has saved my head from being added to some savage's collection. I had nothing much to go on, neither word nor sign, until presently I began to cast over my mind for something, deed or omission, that must surely have given rise to the idea in the first

* Briefly this is, that for every action there is an equal and opposite reaction.

place. I found a number of items, small in themselves, yet cumulative in their effect and surely not without a certain significance.

Everything we had been shown and taught was such as we might have been expected to have learnt in our own world. Of the wonders of Mars, the strides ahead of us she might have made in science, we had been given but the sketchiest glimpses. This may have been accident, again it may not. Even if it were done of set purpose, that purpose might not have any evil intention behind it. After all, one does not attempt to explain an abstruse scientific problem to children unable to comprehend even the fundamental principles. And children we were in certain respects, compared to the Martian minds opposed to us.

Naturally we were allowed more latitude than formerly, and were frequently taken over various parts of the ship, but still there were rooms to which we were never admitted. That in itself was nothing. No engineer likes passengers messing round his engine-room, and I could well understand why we were barred from the control-room, where the chance movement of a stranger might seriously upset delicately balanced and sensitive instruments. But when to all these items was added the fact of our initial kidnaping, and the further fact that a guard of some sort never seemed to be far away from our quarters, there was at least a foundation on which to erect a skeleton of suspicion.

The girl—Norna her name was, and she was the daughter of Bo-Kar, we discovered—had been taken off guard soon after we began our course of instruction with Thrang; indeed, she helped a good deal in our tutoring. She and Retallick seemed to have developed some sort of a liking for each other's company, but whether, on his part, at any rate, it was anything more than a mere attempted

flirtation, I could not say. From what little I could see, the girl neither sought nor resented his company, though I am not prepared to swear that she kept him all the time at arm's length. But whether it was a genuine attachment arising between them or merely a matter of propinquity, I foresaw complications arising from the affair. We were still much in the dark regarding the marriage customs of the Martians—I prefer to call them that rather than the term Rocans, they use themselves—and it might well be that they were utterly opposed to our own conception of such matters.

I would have dropped a word of warning to Retallick, only I had common sense enough to realize that in that way I was more likely to precipitate the very crisis I was so anxious to avoid. Nevertheless it did occur to me, in this connection, that Retallick's friendship with Norna and her supercession as a guard might well be cause and effect. The new guard did not interfere with us, but somehow in our wanderings about the living quarters of the ship he always contrived not to be far away. Like all his fellows he possessed that half-grave, half-smiling cast of countenance whose set expression nothing ever seemed to ruffle. I would have felt easier in my mind had I found them less emotionless.

IT was when the red disc of Mars began to change to the orange globe that threatened to fill the sky that I realized we must be well past the half-way mark, and for the first time that radio call, we had intercepted the night our adventures began, took on an especial significance. If our calculations had been correct, and I did not see any reason why they should not, we must be somewhere in the neighborhood of the answering station. In the circumstances I could conceive of it only as some sort

of space ship. Yet from what Thrang had told me it appeared that the vessel we were on was the only craft of the kind in commission. Unless I had made some grotesque and fundamental error, this expedition was more or less in the nature of an experiment, and on its success or failure depended the building of further inter-stellar ships. I wondered if my unfamiliarity with the language had led to me making a foolish mistake.

At the first suitable opportunity I tackled him on the matter. He seemed rather surprised at first that I had heard any such call, and he asked me a good deal about the nature of the set I had been using. The subject of wireless transmission had not come up between us before, and because, I suppose, of a certain natural cautiousness, I had made no mention of it of my own accord. Our dealings with the Martians had already shown us that, though they were far ahead of us in some aspects of physical science, in others they lagged far behind. Our developments apparently had not altogether been on parallel lines.

It appeared now, however, that they were not behind in radio communication, though their system was somewhat different from ours in certain essentials on which he questioned me closely. Then he sent for Bo-Kar.

The leader of the Martians got me to repeat my story. He seemed more interested in the fact of the radio call itself than in my belief that it might in the first place have emanated from them. He wanted to know the exact time that elapsed between the one call ceasing and the other beginning. This involved a good deal of explanation and calculation, as their method of time-reckoning is somewhat different from ours. It is a duodecimal system based upon their year of 687 days.

When Bo-Kar had turned my figures into their Martian equivalent and Thrang had checked his calculations he turned to me with a sterner expression than I had yet seen.

"Why," he demanded, "did you not tell us of this before?"

Thank Heaven, something could stir him from his preternatural calm; it made him seem the more human, and for the first time in our acquaintance my heart warmed to him.

"Because I did not think it of importance," I said slowly, picking my words carefully in the unfamiliar tongue. "I took it to be a signal passing between you and another ship. It was only when Thrang assured me that this is the only vessel in commission that I began to wonder."

Thrang made a quick movement, and I think he was going to speak, but Bo-Kar caught his eye, and he abruptly subsided.

"This," said Bo-Kar deliberately and distinctly, as though he wanted the words to sink into my mind, "is the only ship of our race capable of traveling through space."

Something in his tone, no less than in the way he had phrased the sentence, sent a suspicion coursing across my mind.

"Then," I hazarded, "there is the likelihood that some other planet may possess intelligent beings capable of constructing space-ships?"

Again that swift warning glance flashed from Bo-Kar to Thrang, and again something stirred uneasily at the back of my mind.

"It might well be," Bo-Kar admitted after a pause. "We do not know, though we hope it is not so."

I HAD a queer feeling, not exactly that he was lying, but that he was in some particulars attempting to evade

a direct issue. It set me thinking. Suppose some other planet inhabited by intelligent beings, had also brought space traveling to some sort of perfection, what did it signify? I could only surmise that it meant that a Martian dream of supremacy in the solar system, due to the fact that they alone possessed the secret of inter-stellar traveling, had gone completely by the board. I was most likely right. If our astronomers are correct—and I saw then no reason why they should not be—our earth was the most desirable of the nine planets. If the Martians had set their minds on it, they would almost certainly resent competition.

It was then that something of the gigantic possibilities behind this spying expedition—it could be no less—seized on my imagination. I could have kicked myself for allowing my scientific interest in the first place to run away with my sense of caution, yet who would have believed that a race so far ahead of us could harbor thoughts of ruthless conquest? I could not be sure even now that such was the case. I might be condemning them unjustly, and their apparent anxiety might be based solely on the fear of an invasion of their own planet.

But whatever was the actual case there remained one consolation. Had we been able to make our story public no one would have believed us. We would have been labelled as liars and cranks, and people would have talked about the state of our mentality. I recalled my own attitude towards the legends of the natives. From this I could see that probably it was not the first time in the history of our world that visitors had come out of space, if not from Mars, perhaps from some other planet. The lore of ancient races was full of tales and legends that we, in our superior wisdom, put down as myths of man-

created gods. But after all isn't it so true, as to be almost axiomatic, that a man cannot imagine things beyond the scope of his own experience?

One faint hope I had in my own mind, that some astronomer might have picked up the space-ship in his telescope, vanished when I recollect that the vessel had both entered and departed from our atmosphere in the bright daylight. If it had been seen at all, almost certainly it would have been taken for a meteorite, and once out in free space its comparative lack of size no less than its constantly increasing acceleration would make it so nearly invisible as not to matter.

In the last analysis the chances were that I was basing both hopes and fears on utterly wrong premises.

I came back to myself with a start. Bo-Kar and Thrang were watching me oddly, as though they guessed in part what was passing through my mind. Their expressions set me wondering if, besides those mind-picture machines of theirs, they had some method of reading my thoughts. It was not impossible. Modern science teaches us that all things can be reduced to vibrations and expressed in terms of waves akin to light waves. If that be so, it is not so revolutionary a step from radio as we know it to simple thought transmission.

I have said that they were both looking at me oddly, yet there was a subtle difference between the two men's expressions. Bo-Kar looked thoughtful, a trifle anxious I fancied, though to that I am not prepared to swear, but Thrang's face was touched with a tinge of sadness, as though something he had feared and dreaded at length showed signs of coming to pass.

EMOTIONLESS I have called these Martians and so by all our standards they were, yet it must not be

thought that they were utterly devoid of all power of showing their feelings. But the fact remains that save in a few instances it took much to move them from their habitual calm. But they could break into activity quickly enough.

Bo-Kar moved now. He took down from the wall one of the things I decided were maps or charts of some sort —we were in the room where most of our instruction had taken place—and spreading it out on a sort of folding ledge that came out from the wall, he called us over. Looking over his shoulder I saw that it seemed to be a chart of a portion of the heavens. It showed the orbital path of the four inner planets, which were drawn to a fairly large scale. Lines ruled between earth and Mars and notes scrawled in their queer caligraphy I took to be calculated space routes with remarks thereon. Each planet had some notes written in near it, but I was not yet familiar enough with their script to decipher more than an odd word here and there.

The moon, however, was strangely ringed, and lines of writing like the spokes of a wheel radiated from it. It seemed strange that they should have studied our satellite with so much care, then as I looked one Martian word written separately and in a much clearer hand hit me right between the eyes. It was the word "*clansek*," which may be translated variously as "base" or "camp" or "outpost." But which ever of the three meanings I gave to it, the conclusion seemed obvious. These fair-seeming, fair-speaking Martians had constructed a depot of sorts on the moon, and since it was a dead world it could only be with the object of making it a sort of jumping off place in any expedition they meant to launch against the earth.

At least Bo-Kar had made no attempt

to hide it from me. There lay the chart open in front of me with the damning word itself staring straight up at me. I stood and waited.

Bo-Kar marked approximately the spot of his vessel's landing and after referring to certain tables, somewhat akin to logarithms I surmised, which hung on the wall above the chart, be plotted a line into space. I saw then what he was driving at; he was trying to locate as nearly as possible the exact spot from which that reply call I had heard must have come. When he at length marked it on the chart it conveyed nothing to me, though evidently it was not without significance to the others. One thing I did notice, and that was that the line passed nowhere close to the moon.

Perhaps this had some bearing on the matter that I could not understand, for Bo-Kar placed his finger on the word "*Clansek*," as though indicating it and turned to Thrang.

"That, no doubt," he said, "would be a prize worth seeking."

Thrang nodded, though it looked from his expression as though he were not so sure as his chief.

Bo-Kar must have read the curiosity in my face, for he turned to me.

"We have explored your satellite more or less fully," he explained. "We halted there on our way to your planet, but the halt was made on the face turned away from you and which you never see. We have hopes of establishing a colony there."

Was he telling me the exact truth? I could not say.

"But why?" I demanded. "What use can it possibly be? It's a dead world."

"But one rich in minerals," he said. "A world I do not think you are likely to wish to use for some time yet. But even should you have that desire, we will not quarrel over it. There is room

and to spare for us both, minerals enough to share for a millenium."

PERHAPS that then was the real explanation. In case it might not be I kept an open mind, though I must admit I don't think he would have been so ready to show me the chart if he were not speaking the truth. But if he were I could see the makings of a pretty pickle. True, the moon was world territory, but once space-travel became an accomplished fact and its riches, whatever they were, began to be understood I could see the nations of the world squabbling over it and even going to war, unless the League of Nations found a way out of the trouble by giving America a mandate to work it on behalf of the world.

But to come back to the matter in hand. Both men were emphatic that the call had passed between no two ships of theirs. The fact that the one we were on was the only one in existence seemed to clinch the matter definitely. Which brought me back again to the identity of the strange ship. If it wasn't a Martian, from what planet did it come?

"Look here, Bo-Kar and Thrang, too," I said. "We're agreed that the ship can't possibly have come from your planet, so this is the way it appears to me. From what I've been told your people have been experimenting off and on for four or five centuries, and making some sort of a success every now and then with a space-ship. Is it so unlikely that on some other planet in our system there are people, or whatever you care to call them, who've started later and reached success just about the same time as you? If you're not prepared to grant some such assumption, I don't see how else you can explain what I heard."

Of course that wasn't quite the way I

put it. Simple and all as the Martian or Rocan language, whichever you prefer to call it, had been to learn, I was not yet able to express my thoughts in it with the freedom and celerity that came later. I still fumbled for words that would convey my meaning and as often as not found any but the right one. Still right throughout this narrative, for the sake of clearness and cohesion, I have given the record of our conversations much as they would have occurred had we been thoroughly conversant with each other's language. Which is not to say that we failed at any time to make our individual meanings plain.

"You've begun by assuming that it was a space-ship," Bo-Kar said with deliberation. "Having assumed so much, and learning that there is only one Martian vessel capable of making such a trip in existence, you must needs look round for a hypothetical planet."

"Well, can you suggest any alternative?" I said.

"Two. For all you know to the contrary someone on your planet may have at last succeeded in making some such ship. You tell me that you have already conquered the air, and that some of your scientists have been experimenting in the direction of inter-planetary travel. Indeed if I have not misunderstood what Thrang tells me, it seems that a considerable literature has already grown up considering the possibility. Scientists love to experiment in secret—at least ours do, and I take it yours are no exception—and it is not improbable that no one should know anything about it until the ship is ready to fly."

"I think even where we were we would have heard something about it," I said dubiously. Nevertheless I had to admit that there was considerable force in his argument. "However, what's the

other alternative you mention?" I went on.

"**T**HAT someone has been carrying out experiments with radio signaling to other planets," Bo-Kar suggested.

"But there was a call and an answer," I objected.

"Not necessarily. One may have been the echo of the other."

"But the interval between them . . .?"

Bo-Kar made an odd gesture with his hands. "Who can explain that?" he said rhetorically. "The vibrations may have gone twenty million of—miles, I think you call them—yes, miles out into space and then for some reason have been deflected back. I am no authority on etheric vibrations, but I do know they play strange tricks."

"What could have deflected them back?"

"Anything. A passing meteorite perhaps. Perhaps that small planetoid you call Eros which is approaching closer to your earth than it has for many years. We know it by another name, and once it was part of a great planet that circled between Roca and Galien"—he meant Jupiter—"and about whose disruption into the fragments Thrang tells me you call asteroids I shall tell you some day."

Either of his suggestions seemed feasible enough on the face of them. We have only touched the hem of the wave-energy business as yet; we can claim to know but little of the vagaries of radio, and it might well be, as Bo-

Kar suggested, that some portion of the energy escaped into space only to be deflected or reflected by some property of the void that we did not understand. We might theorize as much as we wished, but a theory after all is no more than a deduction that further discoveries might or might not prove to be right.

I don't quite know where speculation may have led us had not an interruption occurred at that precise instant.

From somewhere in the depths of the ship came the resounding note of a gong, its very vibration charged with warning and menace. The sound carried through and past us; intervening walls seemed to make no difference to the penetrating quality of its tone.

"What's that?" I cried, starting.

Thrang made an attempt to say something, but Bo-Kar silenced him with a gesture.

"It means," he said with a deep and steady voice, "that you were right and I was wrong. That gong is a call to action stations and it can only be that another space-ship has materialized and shown hostile intention. If you would care to bring your people to the observation room you may see something of interest. At least you will be as safe there as anywhere else on the ship. Thrang will accompany you."

With that he turned on his heel and strode out of the room, and through the door, he had left open for us, the deep and brassy clamor of the gong came with redoubled force and menace.

The Regenerative Wonder.

By WINTHROP W. HAWKINS

We have read of a curious line of insurance of the hands which is used by artists, especially by those in the musical career, where their very life-work is tied up in their hands. Imagine a great violinist, such as Paganini, having his hand paralyzed and being unable to finger the strings of his violin. The clue to this story lies in this feature, and it develops quite an exciting bit of writing.

Illustrated by MOREY

IN high school I remember Irvin Pembert as a tall, dark, serious youth who scarcely ever smiled. We boys were wont to call him unsociable, and to refer to him as a queer fellow, but nevertheless we held a certain respect for him, and marveled at his great ability in physiology and botany, subjects which the majority of us cared very little about. He never took an interest in athletics, and lived almost entirely apart from the rest of the class, but was a musician of no mean talent, and played the piano in the high school orchestra; this was the only organization in which he took an interest, and in which he associated with any of his fellow students.

College did not change him, and I believe that he became even more studious while at the University. He and I attended the State University together, and it was there that we developed our friendship, although we had lived in the same town all our lives and had attended the same high school without becoming more than casual acquaintances.

Our friendship began one Sunday evening. I was reading in my study, when I heard a tap at my door, and, after calling loudly for whoever it was to come in, I was surprised to see Pembert enter the room and, in a rather apologetic voice, say: "Smith, did you get that third trigonometry exercise figured out? I've worked on the damned thing for an hour, and can't do anything with it."

"Sure, Pembert," I replied. "I got it from Fraser this afternoon; he worked it out after lunch. I guess he was the only one in the class who could do it."

"I thought I was the only one who couldn't," said Pembert, seating himself. "I've often thought of what it would be like if everybody had the same tastes and inclinations."

We went over the trigonometry exercises together, and Pembert stayed for almost two hours. I think that I never spent two hours in such an interesting manner as I did that evening. Pembert was the best biology student in the class, and had some very interesting theories. He possessed a very comprehen-



Boldini appeared to be in a sound sleep, but as my friend swung back the projector he stirred and sighed slightly.

hensive knowledge of the cell theory, organic evolution, and such, and I proved a ready listener, as biology was one of my weak subjects, and Pembert was very lucid in his explanations. When he left that evening I gave him a hearty invitation to visit me again, with which he seemed greatly pleased, as he was not popular among the boys, and seldom associated with any of them.

That Sunday evening was the first of many other evenings that Pembert and I spent together. I would sit and listen for hours while he would explain some point in biology and supplement it with some theory of his own, which would invariably prove to be very interesting. We discovered that we had in common a liking for Latin, in which study Pembert was very proficient, and we spent many hours going over Latin grammar or reading Horace and Vergil together.

In due time we both received our B. A. degrees, and Pembert went away to study medicine, while I became associated with a popular magazine and settled in New York. We corresponded for a few years after this, but at length our letters ceased, and I lost track of my old friend.

FI FTEEN years passed by, and one day I received a letter from Pembert; it was post-marked Bangor, Maine, and I immediately concluded that he must have established himself in that city after his graduation from medical college. In the letter he asked me to visit him, pressing me to come as soon as possible, and aroused my curiosity by remarking about having something very important to tell me. The last part of the letter ran:

"... I think that you were really the only personal friend I ever had, and the only one who ever understood me, so I want you to come up here, and be the

first to see what I have done. I should like to talk it over with some one, too, and discuss its possibilities, so pack up and come along on the next train, if possible, and be prepared for something big.

Your old-time friend,
Irvin Pembert."

He met me at Bangor, and, as I shook his hand, I could not but notice the aged look which he wore, and the predominance of grey in his hair. Pembert could not have been more than forty-five years of age, yet he resembled a man of sixty or more. I thought to myself: "The same old Pembert—all work and no play." He was genuinely glad to see me, and regarded me almost with tears in his eyes.

It was then about eight in the morning, so we breakfasted at a restaurant, and soon afterwards were speeding northward in Pembert's car. He explained that we should not reach our destination until after nightfall, so we took along some fruit and ginger ale to serve us as lunch, as we should not be stopping *en route*.

As we drove along we discussed the past, and related our various experiences since college days, but Pembert remained silent upon the subject about which he had written me. I, of course, was very curious, but when I mentioned it, he merely said: "All that in good time, Smith; a little later." He told me about his life after the completion of his medical studies. He had practiced in Chicago for a few years, and then in Milwaukee, but finally had left the West and moved to Boston. From Boston he had come up into Maine, where he had resided ever since. He was still a bachelor, and explained that he had not had time to bother with women. Not once during our journey did he volunteer anything concerning what he had written me about in his letter.

WE drove on a road through the woods all day, and at about twelve that night arrived at Pembert's place, a large, log camp in a grove of pines. He had with him a Negro servant, whom he called Sam, acting as valet, cook and handy man, who prepared us an excellent dinner, to which I did ample justice after my long drive in the bracing air. Pembert ate little, and seemed restless and rather excited all through the meal. When finally we had lit our cigars over the coffee, he settled back in a large arm-chair and began:

"Now, Smith, I am going to tell you why I have brought you up here, and what I have to show you. I suppose your knowledge of biology is rather limited after these years away from college, eh?"

"Well, I still remember a little about amoebas and frogs," I replied, "but it's pretty hazy, so don't go too deep into detail, Pembert."

"There's really not much to it, in a sense," said he, "but to illustrate: Do you remember the hydra we used to study, and how two individuals can grow from one which has been cut in two—regeneration, we call it?"

"Yes, I recall that," said I, wondering what was his point.

"Perhaps," he continued, "it would be better to say: Cut a piece from one and another piece will be grown to take its place. Well, I can do the same with any other animal, man included."

At this startling assertion I grew dizzy and my vocal organs seemed completely paralyzed. Pembert slowly tapped the arm of his chair with the fingers of his right hand, and regarded me with a level gaze. At length I blubbered out: "Why, man, do you mean . . . do you mean that you could cut my head off, and it would be possible for me to grow another one?"

"I have never tried it," he answered, with a short laugh, "but I have reason to believe that it could be done."

I simply stared in bewilderment, and presently he continued:

"I'm glad you didn't take it as a joke, as the majority of people would," and then, straightening up executively: "Well, I'll endeavor to tell you all about it.

"THE idea hit me when I was practicing medicine in Chicago, and in my spare time I made my researches and collected all the material I could, pertaining to cells and their structure, at the same time working on and experimenting with various rays, chiefly those produced by radium and electricity, which I thought might be of help to me in discovering something to serve my purpose. Then I moved to Milwaukee, and there, with the help of Robert Sill, one of the most brilliant scientific men in the country, although not widely known, I got my idea fairly under way, in a theoretical sense, but lacked the capital necessary for any conclusive experiments.

"However, Sill was acquainted with a millionaire in Boston, to whom he wrote, appealing for financial aid. He was, of course, curious, and wanted us to come to Boston first, which we did. We explained what we were working on to Granby—Allan R. Granby was his name—and he immediately became interested and offered to advance us any amount we wanted, to be invested in material to be used for experimental purposes. I had amassed a considerable fortune while in Chicago, but had expended practically all of it, while experimenting on a small scale in the West, and my helper was in the same financial straits, so we were indeed lucky to secure Granby's help.

"Sill's death was rather a detriment to me, for he died of heart failure four

days after our arrival in Boston; but things were in a condition so that I could carry on alone, so I brought Sam along, and came up here out of the way to work. Granby furnished all the money I needed, which was a considerable amount, for I had to use some radium, and at length I had the satisfaction of seeing things in order for some conclusive experiments. It took me a considerable time, for Sam and I had to do all the work ourselves, and I spent many hours working on the ray which I use. Then I experimented on a dog, and found it to be a success, after which I immediately wrote to you, even before I wrote to Granby, for I wanted you to be the first to see what I had accomplished."

Pembert paused, and I sat staring, almost as completely bewildered and in the dark as ever. Then he continued:

"If you would rather wait until morning, we can go to the laboratory then, but——"

"I'd rather go now," I eagerly interrupted, full of curiosity and wonder.

PEMBERT led the way to a door at the back of the room, and we entered. The laboratory was large, with several tables and cabinets filled with chemicals and scientific instruments. In the middle of the room was what resembled an operating table, with the ends and sides turned up, so that it formed a sort of a tank set on legs, on each side of which were tanks, the one on the side nearer me being considerably larger than the other, and there was a tube running under the table, connecting the tanks. Near by was what I immediately took to be the projector of the ray about which my friend had spoken. There was a large, rectangular box, the length and breadth of the table, suspended by wires from a movable, metal support, and connected by

other wires with a set of batteries in one corner of the room. Indicating this, Pembert began:

"This, Smith, is the ray projector. Sill did most of the work in connection with it, and had it all on paper before he died, so that all I had to do was to construct it. Of course, the original idea was mine, but I could not have progressed far without his help, as I was not very well trained in mechanics and physics. Radium and electricity are both used in the production of the ray, which is projected through the glass in the bottom of the box. The glass is also our invention; it is very tough, and thick, and serves to amplify the ray as it passes through it."

"And does this ray have the power to cause an organism to regenerate any part of the body that has been removed?" I asked.

"Not directly," my friend replied, "but we might say that it prepares the organism to regenerate the part. I'll explain more fully.

"This ray has the power to reduce all the cells of the organism to the same level, as far as function is concerned. In other words, it unspecializes them. As you know, man and all higher metazoa are composed of many different kinds of cells, all specialized for some particular function, such as muscle fibers, nerve cells, and the like; but in the lower metazoa, such as the hydra, we know that the cells are not highly specialized, and this gives the animal the power to regenerate a whole from a part of the organism. So you see that, with this ray, the same thing is made possible for all animals."

I fairly gasped as I realized the possibilities of this thing: The amputation of a limb need no longer be dreaded, as another might easily be grown to take its place; a man might be cut into a number of pieces, and each piece might

be made to regenerate another man. But what complications might then arise; which would be the original man, and would they all have the same psychological traits?

I laughed aloud as these and similar fantastic thoughts struck me, but immediately checked myself and gave Pembert my attention as he continued.

"THIS table is what we might term the operating table. It is my own invention, devised for this special purpose. You will notice that the ends and sides are turned up, so as to form a sort of vessel, in which a body surrounded by a liquid may be conveniently kept. In the tank on the left is stored water, in which have been dissolved all the food elements essential to the nourishment of the organism, while the new limb or whatever it happens to be, is being formed. After the ray has done its work on the body, I let this liquid flow from the tank into the vessel, where the cells of the organism may absorb the food elements from it, and give off their waste matter into it. I then slightly incline the table, so that the liquid may flow through an opening on the other side, and pass into a second tank, where there are chemicals which purify it; it is then forced into the first tank through the tube which passes under the table, and is recharged with food elements. Thus a constant flow is kept up between the two tanks, and the organism is supplied abundantly with nourishment. The limb, or whatever part of the body is to be amputated and regenerated, I remove after the organism has been subjected to the ray."

"Is this necessary to the success of the operation?" I asked.

"Yes," he replied; "if it were removed before the cells were transmuted, it could not be regrown, for it is natural for the body to grow into the same form which

it had after the cells were transmuted by the ray."

I nodded, and Pembert continued:

"In one of my first experiments, I endeavored to grow a tail on a dog, but I removed the original tail before the cells of the animal had been transmuted by the ray, and the result was very surprising, although perfectly natural under the circumstances." Pembert smiled wryly, and continued: "Instead of regenerating the caudal appendage, the organism began to multiply by germination. I was deeply interested, so I let the process continue, and now I have two dogs where I originally had one. They are identical in every respect, except in size, the original one being the larger; and, of course, both are tailless."

Pembert laughed shortly, and I weakly subsided into a chair. "I'd laugh, too," I said, "if anyone but you had told me this, Pembert."

"I can assure you of its truth," he replied; "both animals are outside in my kennels, living healthy, normal lives."

"But you haven't explained how you convert the body into its original state after your purpose has been served," I said, when I could find my voice.

"I SEE that I am still afflicted with absent-mindedness," my friend replied, "or I should have mentioned that before. That function, also, is performed by the ray; to do this, a different combination of radium and electricity is used in its production. As I have said, Sill did most of the work in connection with this ray, and was practically responsible for it, as I could not have progressed far without his help. When he died, he left the results of his research, and proposed plans for the perfection of the ray, all on paper, so that with this help, I was enabled to successfully construct the projector. You will notice that there are two switches

to be used in the operation of the ray; one produces the combination in which radium plays the leading part; this is the one which transmutes the cells of the organism, and prepares it for the regenerative process; the other produces the combination in which electricity is chiefly used, and this restores the body to its original state. In my practice in Chicago, I had had considerable experience with radium and electricity, as well as with several different rays; the two former subjects suggested immense possibilities to me, and in my spare time I carried on a few private experiments, with some very astonishing results. I realized that with the help of a trained electrician I might accomplish much more, so I moved to Milwaukee and secured the help of Sill, who immediately became interested in the subject, and took over practically the entire work on the ray, which gave me more time to spend in my biological research, and thus I was enabled to get ahead much faster in the development of my idea. Of course, I kept track of Sill's work, and superintended it, in a way, so that he could work on my idea, and improve on what I had already done. I won't go into any further detail in connection with the ray, as it would undoubtedly prove rather confusing to you, and I confess that I myself am not much of an authority on some of the details."

"Yes," I replied, "I've done well to take in as much as I have to-night, but I'd certainly like to witness an operation."

Pembert glanced at his watch, which showed three o'clock. "I guess we have no time for anything like that now," he said, "but in the morning we'll perform one; and now, I think, we may as well go to bed, as I confess I am rather fagged after my long drive today, and you, too, must be fatigued after your journey. Sam will have left us some

proper refreshment in the dining-room."

I slept little that night, and was up and dressed before six o'clock. It was an ideal summer morning, and the fresh air and scent of the pines refreshed me as much as a good night's sleep would have done. I discovered the road by which we had arrived the previous night, and strolled along it through the woods. It was a road which I presumed Pembert and Sam must have made themselves; it was well laid and extended for about a quarter of a mile, where it connected with the main road by which we had come from Bangor.

When I returned to the camp, Pembert was up, and after we had breakfasted he took me outside to his kennels, where he kept a number of dogs for his experiments. He showed me the two he had told me about the night before; they were stretched out side by side in a patch of sunshine, and seemed perfectly normal in every respect, except, of course, that they were tailless, as my friend had said. They were white bull-dogs, with two black spots on their backs, both being marked exactly the same.

"**W**HY not try an operation on this one?" I asked, indicating the smaller of the two; "His life history, what there is of it, is a very interesting one. I should like to observe him a little closer."

"As you say," replied Pembert, and, taking the dog, we entered the laboratory.

With my heart beating excitedly, I watched Pembert administer chloroform to the animal, and place him on his side on the operating table.

"He would probably not be inclined to stay on the table of his own free will," my friend said, "so by chloroforming we avoid unnecessary trouble, as it

would be rather bothersome to have to strap him down."

As he swung the ray projector around, and suspended it over the table, I cautiously drew back, nevertheless craning my neck, so as not to miss anything. Glancing at me, my friend laughed, and assured me that I need have no fear, as the ray was focused on the top of the table, and would have no effect on anything outside of the organic matter on its surface. He then made a few adjustments and turned a switch.

For a few moments nothing seemed to transpire, but soon I noticed that the hair of the animal was turning a flesh color, and presently it looked as though there was no hair whatever, covering the skin, but upon close examination it could be seen that nevertheless it was there, the flesh color giving one the impression that the skin was bare.

"Does the ray have the same effect on the side not turned towards it?" I asked.

"Yes," replied Pembert; "it has the power to penetrate the body, so reaches all parts at once."

I then noticed that the flesh color was changing to a pale pink, and within five minutes it had changed from this to a yellowish hue. At length the organism was reduced to a jelly-like, almost transparent substance, and Pembert switched off the ray and swung the projector back.

"Seventeen minutes and eight seconds," he exclaimed, glancing at his watch. "It usually takes in the vicinity of fifteen or eighteen to transmute a dog. For a man it would take slightly more, while for a frog or a snake, it would take less time. The higher up in the scale of evolution the animal is, the more time is required for the process." He then neatly detached the head, or what had been the head, smiling at me as he did so, and saying: "Probably you would

be more interested in seeing the head regenerated than anything else, as I remember your first question last night was concerning the possibilities of the regeneration of your own."

I TRIED to smile, too, but was so excited, and full of nervous anticipation, that I could manage nothing but a grimace, at which my friend laughed aloud as he tossed the handful of transmuted cells, which had originally composed the head of a dog, into a basin on a near by table. He then inclined the top of the table slightly to one side, and opened the orifice of the tank on the lower side. He opened a similar orifice in the tank on the elevated side of the table, and a flow of liquid was set up, which immersed the organism as it flowed through the tank-like vessel whose bottom served as the top of the table.

"There will be no appreciable change in the appearance of the organism for at least an hour," my friend said, "and the whole process of regenerating the head will not be complete until late this evening; it is not necessary for us to remain here, so we'll go into the library; you will probably be interested in some of my volumes, and I have also some original writings on various biological subjects, which I should be glad for you to criticize and pass upon their suitability for publication, since you are a literary man. We can return here at intervals and note the progress of the experiment."

At the end of an hour we again went to the laboratory to view the organism. It could be noticed that where the head had been detached a slight swelling had begun to appear. Pembert said that by noon there would probably be quite a pronounced bulge, but that until then nothing of interest would transpire, so we again repaired to the library, which was a small room opening off the lab-

oratory, and I continued my inspection of some of my friend's manuscripts.

At twelve we had our lunch and again went into the laboratory. This time there was a pronounced swelling on the neck, and Pembert said that in two or three more hours we could notice the head begin to take shape, which proved to be true. By dinner-time all the head except the snout was formed, and I was beginning to grow excited again, to my friend's great amusement.

"Lord, Pembert," I said, "you don't seem to realized what a wonderful thing this is; you seem to take it so calmly and regard it in so matter-of-fact a way."

"Perhaps it's because I've been associated with it for so long that I've grown accustomed to it," he replied. "I've been working on this for years, so you see that it is matter-of-fact with me by this time; anyway, it soon will be commonplace, and in a year or two will be talked of as nonchalantly as electricity, airships, or any other of the great inventions and discoveries."

After dinner we went back to the laboratory, and prepared to stay until the experiment was completed. I placed my chair close to the table, so that I might watch the experiment more closely and be sure not to miss anything that might be of any interest. Pembert produced cigars and leisurely sat down, saying: "It will take several hours yet, so don't get too impatient, Smith," and after a moment continued: "By the way, do you ever hear of Fraser, or Dobell, or any of those fellows who went to the State University with us? I saw Kenneth White in Chicago, once, and . . ."

THUS our conversation was turned, and drifted from one subject to another, but my mind didn't stray far from the room in which I was seated.

At intervals Pembert would get up

to note the progress in the growth of the snout, and at nine o'clock, when it was about half regenerated, he said that it should be complete by midnight. When the clock had struck the half hour past eleven he arose and brought his chair close to the table. "It should be complete within at least three-quarters of an hour," he said, "so we'll be prepared."

All except the tip of the snout was now complete, and Pembert was closely examining the head under a large magnifying glass. At length he focused it on the snout and waited. After what seemed hours the clock struck twelve, at the first stroke of which I jumped nervously, to Pembert's amusement. To me it seemed that the regenerative process was complete, but my friend made no move, so I waited as patiently as possible until seven minutes past twelve, when he quickly arose, donned rubber gloves and shut off the flow of liquid from the tank which supplied the nourishment for the organism. The fluid drained away into the other tank, and, shutting the orifice in the latter, Pembert righted the slight incline in the table. Then, turning to me, he said:

"How does it look, Smith—complete?"

"It looks exactly as it did after you first transmuted the cells," I truthfully answered.

"Now for the finishing touch," he said, and swung the ray projector into place, focusing it on the top of the table, whereon rested the subject of the experiment. He made the adjustments, and after a moment turned a switch. My heart was pounding excitedly, and I stood up and gripped the back of my chair. Pembert was preoccupied, and I was as well satisfied, for he would have been amused by my excitement.

Presently the body began to take on a yellowish hue, and after about five minutes changed gradually to a pale pink; the pink grew darker, and in ten

minutes had given place to a flesh color, and finally, after a longer time, the hair could be distinguished, and the natural colors began to appear. Then the body stirred and the eyes blinked. Pembert switched off the ray, and pushed the projector back.

"It takes a longer time to bring an organism back to normal than it does for the first transmutation," he said.

The dog appeared to be in a sort of stupor, but, after Pembert had closely examined him, he said that he was perfectly normal, and in a few moments would fully recover.

As he finished speaking, the animal stirred again, sat up, and yawned, as if awaking from sleep. Then, jumping from the table, he sniffed at my shoes, and nonchalantly trotted out at the door, which we had left open on account of the sultriness of the summer night.

For a while we said nothing, but finally Pembert broke the silence.

"Of course you are aware that it would be possible to regenerate another organism from the original head of the animal, in its present transmuted state," he said, and after a moment added: "It would take a much longer time, of course, probably several days."

"Well," I replied, "I've seen enough for one day, and, if you want to, you may try that to-morrow. but I'm for a walk in the fresh air, and then to bed."

"For my part, I don't feel like any more experimenting to-night," he said, "and a walk would be refreshing, so we'll let things go until to-morrow, anyway."

Every morning, before breakfast, it was customary for Sam to go to a near by village, a distance of perhaps three miles, for a daily newspaper, which Pembert was wont to read during his breakfast. Thus it happened that on

the morning after the day of the experiment, as we sat down to our breakfast, Sam, as usual, brought the newspaper in and laid it on the table. Pembert was engaged in preparing an orange, so I took the paper and leisurely opened it up. The headlines ran:

FAMOUS VIOLINIST MAY LOSE USE OF LEFT HAND

Luigi Boldini, Famous Italian Violinist,
Meets With Unfortunate
Accident

Victim Stricken With Grief—Surgeons
Doing All In Their Power

I read on:

"New York, July 18, 19—Luigi Boldini, the famous Italian violinist who for the past three years has been a resident of this city, met with a very unfortunate accident here this afternoon, when he accidentally caught his heel and fell while descending from his automobile on Fifth Ave. near 104th St., breaking bones in the second and third fingers of his left hand. He was at once removed to Bellevue Hospital, and Dr. H. A. Hadley, famous bone surgeon, was at once summoned to render surgical aid. Signor Boldini is stricken with grief, believing that he will never again be able to play the violin, and Dr. Hadley expresses himself as skeptical as to its possibility, saying that the fingers will probably always remain stiff. Much sympathy is extended to Signor Boldini and a fortunate recovery hoped for."

I PUSHED the newspaper across the table. "Read that, Pembert," I said.

He glanced at the headlines, then picked up the paper and read the article. When he looked up, our eyes met. Both knew what was in the mind of the other.

"Pembert, would it be possible?" I almost whispered.

"I think so," he said.

"But if the hand was not normal, such as his is now, would it not be regenerated in the same abnormal condition?"

"I think not," he replied; "various crustacea, such as the crab, can gnaw off an injured limb and regenerate a perfectly normal one; it is a law of Nature, and I have no doubt but that the same might apply in this case; besides, there has been no part of the hand lost, and when the organ is removed after being transmuted, the defect will be removed with it."

He was growing more excited as he talked; then he seemed to reach a mental decision. "Smith, do you know Boldini personally?" he asked.

"I have been acquainted with him for the last year or so," I answered.

"Well, we're going to New York after him," he announced excitedly. "Hurry up with your breakfast!" And he delved into his orange. At that moment Sam entered the room and, upon being greeted with, "Quick, Sam, some sandwiches and a thermos bottle of coffee," he fled to the kitchen.

We reached Bangor that night and took a Pullman for New York.

Upon our arrival we learned that Boldini was still at the hospital, so we immediately went there. We were cautioned by the nurse to be very careful in our conversation with him, as he burst into tears at the least mention of his injury. She also told us to encourage him as much as possible. Then we were ushered into his presence.

He was propped up in an easy chair, gazing blankly before him, and it could be seen that he had suffered, mentally, if not physically. There were dark rings under his eyes, and his usually pink cheeks were drawn and pale. As we entered the room, the nurse announced:

"Mr. Smith and friend to call, sir," and withdrew.

"A H," remarked Boldini, dejectedly, "it is my friend Signor Smith, the writer. You have come to extend sympathy?" He extended his hand, but his customary bright smile was lacking.

"You have my deepest sympathy, Signor Boldini," I replied, grasping his hand. "May I present my friend, Dr. Pembert? Probably he may have something encouraging to tell you."

"Ah, Signor Pembert, it is a pleasure indeed," said Boldini, in his careful English. "Kindly excuse me for not rising, but I am weak, my legs tremble . . . Ah, Signor, I am in deep sorrow; my hand is broken; I shall never again play upon my violin. I am in despair." Tears gathered in his eyes and ran down his cheeks. Pembert looked at me interrogatively, and I nodded.

"Signor Boldini," said my friend, "would it surprise you if I told you that I could heal your hand, make it entirely normal again, all in the course of one day?"

The Italian looked up.

"But the doctors have worked over my hand; they have encased it"—he held it up, showing it in a cast—"but the Signor Hadley tells me that my second and my third fingers will remain stiff, even after the bones have healed. Ah, indeed, my good doctor, I shall never again play my violin," and his voice broke.

"But Signor Boldini," continued Pembert, "my method would be entirely different. I should remove your hand, and grow another in its place."

The Italian regarded my friend enigmatically. "You would remove this, my injured hand, and would replace it with another?" he asked. "Surely, my good Signor Pembert, you speak not in earnest."

"I am sincere," replied Pembert.

"This new hand would have no defects?" inquired the violinist.

"It would, as far as I know, be entirely normal," my friend answered.

Boldini turned to me appealingly. "My good Signor Smith," he asked, "is your friend, the Signor Pembert, indeed sincere in his astonishing statements?"

"I can assure you that he is," I answered.

"Ah, indeed, Signor, I beg your pardon most humbly for doubting your words," he said, turning to Pembert. "If you can indeed perform this wonderful thing of which you speak, gladly will I have it done, although it cost me much pain and all the money which I have." He was about to burst into tears again, but Pembert laid his hand on his shoulder and said:

"Come now, Signor Boldini, you must prepare to come with us. We have a journey to make, and you must have some food to sustain you; you look as though you had not eaten much for a day or two."

"Indeed," the Italian replied, "I have not eaten; I could not, but now that my hand is to be restored, and I shall again be able to play my violin, I shall be all right once more."

THE flicker of a smile crossed his face, and I rang for the nurse. "Signor Boldini is returning home," I told her. "Will you please call a taxi for us?"

"This is a very unprofessional thing for me to do," Pembert remarked, as we were driving to a hotel, "but Dr. Hadley will understand in a few days, for by that time I intend to show my invention to the world; until after this I prefer to keep it a secret."

We had disguised Boldini as best we could, and went to one of the cheaper hotels for dinner, as Pembert was

anxious to keep things secret until after the operation at least, and his being seen with the violinist, whose name was now on everybody's tongue, would probably lead to some unwelcome complications.

My friend rejoiced to see the Italian partake of a hearty dinner, which, however, he managed with difficulty, as he was posing as a poor artist, with his injured hand in a sling. Before going to the station, at Pembert's suggestion we called at Boldini's studio, and procured his violin, which we took along, Boldini insisting on carrying it himself, much to Pembert's uneasiness.

We arrived in Bangor the next morning, and, after having breakfasted, set out on our all-day motor trip to Pembert's place. Upon our arrival there, Boldini was greatly fatigued, but nevertheless wanted to have the operation performed that night, to which my friend would not consent, suggesting that he get a night's rest first.

I did not attempt to sleep that night, but sat reading a book until four o'clock, and then crept downstairs and out of doors among the pines. I strolled along across the carpet of needles, watching the stars and waiting for the sunrise, and presently, when I had reached a point behind the kennels, where I could see the rear of the house, I noticed that the laboratory was lighted up, and upon coming closer, and looking in at the window, I was surprised to see Pembert, fully dressed, engaged in minutely going over the apparatus connected with the operating table. The ray projector was close by, and I suspected that he had recently completed an inspection of that also. Upon my entering, he looked up.

"How long have you been here, Pembert?" I asked. "I didn't hear you go down-stairs or I should have gone with you. I haven't slept any, confound my nervousness."

"I've been here all night," he replied.

"I wanted to check up on things and be prepared for the morning, so it seems that the night was the only time in which to do it. Oh, I'm used to working all night," he added, smiling slightly. "I've burned midnight oil plenty of times."

I DID not doubt the truth of this, for I had known him of old.

In another hour he had finished his inspection of the apparatus and, covering it with a sterilized sheet, he straightened up, saying: "Now I'll snatch a nap and then we'll have breakfast. Let Boldini sleep as long as he likes; he'll probably wake early enough." He quietly ascended the stairs to his small bedroom, and I went outside again.

It was now coming dawn, and the tops of the tall pines could be discerned against the sky, which was clear, indicating a fine day ahead.

I strolled along the road, thinking of what was soon to take place and marveling at the wonderful possibilities of my friend's invention. The operation on Boldini would set forth its most valuable practical application and, incidentally, be a very conclusive experiment. Boldini was the genuine musician, willing to risk anything in order to retain the ability to practice his art. He had never asked a question concerning the danger involved, or any other of the details—the knowledge that he would have a normal hand once more, being sufficient to induce him to face the unknown. I marveled at his courage and love for his art.

I returned to the house shortly after seven o'clock, and found Pembert just descending the stairs.

"Boldini is awake," he said, "and will be down presently. Now we'll have our breakfast."

We entered the small dining room and Sam began serving the meal. "Isn't Bol-

dini to have anything this morning?" I asked.

"No, I think it better that he eat nothing," he replied.

At that moment the violinist entered the room, attired in Pembert's bath-robe and slippers. "Ah, good morning, Signor Smith," he said. "Indeed, I am lazy this morning; the Signor Pembert found it necessary to wake me, otherwise I would have slept the entire morning."

"You had better not eat anything this morning, Boldini," Pembert said. "I'd rather you should have an empty stomach."

"Indeed, my good doctor, I could not eat," replied the Italian. "I am that excited that food has no appeal. I can think of nothing but of having my hand cured, or, as you have said, receiving a new one."

"YOU understand, Signor Boldini," Pembert explained, "that there will be a certain amount of risk in this, and that you will have to take my word, that as far as I can, I shall not harm you in any way, and shall endeavor, to the very best of my ability, to make the operation a success. My invention has not been given to the medical profession as yet, and I am the only one who has the apparatus, having built it myself; but Mr. Smith can assure you that it is competent to do what I have told you it can, as he has recently witnessed an experiment."

"Indeed, Signor Pembert," replied Boldini, "I doubt not but that you have nothing but the highest motives in endeavoring to do this, and willingly would I risk even my life to have my hand restored."

"I am glad that you feel that way, Signor Boldini," Pembert replied, rising. "We shall proceed immediately, if you are ready."

"I am ready, my good doctor," replied the Italian.

We entered the laboratory, and Boldini looked around interestedly.

"This apparatus is your own invention, Signor Pembert?" he asked, wonderingly.

"All except some work done on the preparation of the ray projector," Pembert replied, indicating that instrument. "Robert Sill, of Milwaukee, who is now dead, assisted me with that."

"Ah, Signor, if it will but restore my hand, gladly shall I pay anything which you may ask," said the violinist, with emotion.

"We'll consider that later," Pembert said, and then proceeded to explain about the cells of the body, how they were affected by the ray, and how a part of the body may be removed and regenerated, to which Boldini listened fascinatedly.

"And this is what you would do to me, Signor Pembert?" he asked.

"It is, Signor Boldini, if you still feel like undergoing the operation," my friend replied.

The Italian regarded the operating table and the ray projector for a few moments, then raised his injured hand, still encased in the cast, and looked at it, despair written on his countenance. Finally he said:

"Signor Pembert, I realize that I may be taking a great risk when I consent to undergo this, and that I may even meet death, but how much rather would I meet death than never be able again to play my beloved violin! I consent," and tears gathered in his eyes.

"All right, Boldini," said Pembert. "Of your own free will you consent to undergo this, knowing the risks involved. Are you willing to sign a statement to that effect, so that if anything should go wrong, I shall not be held responsible

for it? Mr. Smith is also here as a witness."

"I will gladly sign it," replied Boldini. Pembert produced the paper, and he signed.

After the cast had been taken from his hand, Boldini removed his bath-robe and slippers, and stretched himself on the table, showing no signs of nervousness whatever. As Pembert swung the ray projector into place, he closed his eyes. The switch clicked, and my friend bent over eagerly. "He appears to have gone unconscious immediately," he remarked.

QUEER sensations coursed up and down my spine, as I watched the body of the great violinist turn to a deep flesh color, almost red, which eventually merged into a pink; the pink gradually faded and gave way to a yellowish hue. Then the stage in which the body appeared almost transparent was reached, and I heard the click as my friend turned the switch. He pushed the projector back. "Nineteen minutes and fifty-one seconds," he remarked. "It functioned perfectly."

"This is certainly a strain on my nervous system," I said, dropping into a chair. "I hope I don't have to witness many more of these fantastic processes."

"You'd soon become inured to it," said my friend, with a short laugh, as he neatly detached the left hand at the wrist, after which he opened the orifices in the tanks on either side of the table, and slightly inclined the latter in the correct way, which set up the flow of nourishing liquid.

By lunch time a pronounced swelling had appeared at the end of the wrist, and Pembert was greatly satisfied with the progress of the regenerative process. "Everything points to success," he said.

In a few hours the hand had begun to take shape, and we spent most of the afternoon in the laboratory. By dinner-

time all but the fingers were formed, and the thumb had already started, so, after we had dined, we went to the laboratory to await the completion of the process. "It should be completely regenerated shortly before midnight,"' Pembert remarked, bending over and looking closely at the new-forming organ.

Some time around eleven o'clock Pembert stepped into the library. He returned back with Boldini's violin case under his arm. "I thought I'd have it in readiness," he said, with a slight smile.

By this time I was beginning to feel nervous, despite all my mental efforts to remain collected. Eleven-thirty found me standing gripping the back of my chair, and Pembert studying the tips of the new-formed fingers under his magnifying glass. He remained thus for about five minutes, then suddenly he straightened up and shut off the flow of liquid in which the body was immersed. "Everything has functioned perfectly, so far," he remarked, as the liquid drained away.

MY heart was thumping so that I scarcely heard the click as he turned the switch; and then, as I watched, the yellowish hue began to permeate the body. It must have taken nearly half an hour for the Italian's body to pass through the various stages up to flesh color, but finally the natural hues began to appear, and the hair to turn its natural black. I instinctively moved closer in my excitement, and presently Pembert switched off the ray.

Boldini appeared to be in a sound sleep, but as my friend swung back the projector he stirred and sighed slightly. Pembert was bending over him with a glass of stimulant in his hand, and, as he stirred again, he lifted his head and forced some of it through his lips. Presently his eyes opened and he gazed blankly at Pembert bending over him.

As the stimulant again touched his lips he tried to sit up, but fell back again as if overwhelmed with drowsiness.

"He'll be all right presently," said Pembert with a satisfied air. "His condition seems to be perfectly normal." At that moment Boldini opened his eyes again, blinking several times, and finally sat up and looked around the room, as if collecting his thoughts.

"How do you feel, Signor Boldini?" my friend asked anxiously. The violinist held up his left hand, and moved the fingers, one after the other.

"A H, my fingers!" he cried joyfully; "they are perfect. My violin—bring me my violin!" And he clambered from the table excitedly. Pembert took the violin from its case.

As Boldini cuddled the instrument under his chin, tears ran down his cheeks and he impetuously broke out into Italian, murmuring lovingly, as it were, to his violin. Then he touched the strings with his bow, and it seemed that joy itself was set free at that moment. His fingers glided and danced over the strings, and his bow brought forth music of which I had never heard the equal, although I had listened to many an artist.

Pembert was a lover of music, and sat listening, his eyes intent upon the face of the Italian, and his hands clasped over his knees. With his eyes half closed, Boldini played on, changing from theme to theme, and finally stopped.

"Ah, my good Signor Pembert, what can I do to repay you for what you have done for me?" he cried, in a burst of emotion. "Gladly will I surrender to you anything it is in my power to give. What do you ask of me, my good doctor; how may I reward you?"

"Your music, Signor Boldini, is ample recompense," Pembert replied.

THE END

Triplanetary

By EDWARD E. SMITH, Ph.D.

Serial in Four Parts—Part Two

Illustrated by MOREY

WHAT HAS GONE BEFORE:

RUMORS of piracy are rife. Two interplanetary ships have disappeared in space, without a word and without leaving any wreckage behind them. Conway Costigan, a Sector Chief of the Secret Service of Triplanetary—the government of the allied planets of Earth, Mars and Venus—is serving as First Officer aboard the passenger liner "Hyperion." He and Clio Marsden, one of the passengers, have been very friendly, and are dancing together when the air of the vessel is poisoned by "Vee-Two" gas. He sounds a general warning, then manages to reach a lifeboat, where he resuscitates the girl. He finds and kills the man who has been liberating the gas, then he and Clio join the surviving officers in the control room. The "Hyperion" is attacked and crippled by an invisible ship, and is towed to the pirate base, an invisible planetoid floating in an orbit around the sun.

Roger, the owner and ruler of the planetoid, a man of mystery, holds some of the passengers for ransom and kills others; but takes a fancy to Clio. Captain Bradley of the "Hyperion" and Costigan are imprisoned. Costigan has already given Clio and Bradley easily concealed ultraphones, and thus they are able to communicate with each other without detection. While Clio holds Roger's attention in her apartment, Costigan and Bradley escape from their cells and wreck the power-room; destroying the artificial gravity of the planetoid. They then rescue Clio and steal a lifeboat, in which they start back toward the earth. They have not gone far, however, when their vessel is drawn into a peculiarly opaque fog of crimson energy. They are conscious, but are rendered helpless by a temporary paralysis of all voluntary muscles. Costigan has been in touch with Virgil Samms, the Chief of the Secret Service, and most of the Peace Fleet of Triplanetary has been ordered to concentrate upon the supposed location of the planetoid.

Aboard the "Chicago," one of the vessels of the fleet, is Lyman Cleveland, the beam expert, who is also a Secret Service operative. He locates the planetoid with an ultra-beam, and the fleet goes into formation; being attacked as it does so by the robot-manned vessels of the "pirates." The "Chicago" is ordered to withdraw from the action, so that Cleveland may record, by the use of his newly developed ultra-cameras, every detail of the battle. Triplanetary's fleet is victorious over that of Roger, and is about to attack the planetoid itself when both fleet and planetoid are assailed by the same red radiance into which Costigan and his friends had been drawn.

To begin the following installment the scene is shifted across some hundreds of light-years of space to the home planet of the invaders; and backward in time sufficiently to explain why and how they came to visit our solar system.

CHAPTER IV

Within the Red Veil

NEVIA, the home planet of the marauding space-ship, would have appeared peculiar indeed to Terrestrial senses.

High in the deep red heavens a fervent blue sun poured down its flood of brilliant purplish light upon a world of water. Not a cloud was to be seen in that flaming sky, and through that

dustless atmosphere the eye could see the horizon—a horizon three times as distant as the one to which we are accustomed—with a distinctness and clarity impossible in our Terra's dust-filled air. As that mighty sun dropped below the horizon the sky would fill suddenly with clouds and rain would fall violently and steadily until midnight. Then the clouds would vanish as suddenly as they had come into being, the torrential downpour would cease, and, through that huge world's wonderfully transpar-



Many bridges and more tubes extended through the air from building to building, and the watery "streets" teemed with surface craft, and with submarines.

ent, gaseous envelope, the full glory of the firmament would be revealed. Not the firmament as we know it—for that hot blue sun and Nevia, her one planet-child, were many light-years distant from Old Sol and his numerous brood—but a strange and glorious firmament containing not one constellation familiar to earthly eyes.

Out of the vacuum of space a fish-shaped vessel of the void—the vessel that was shortly to attack so boldly both the massed fleet of Triplanetary and Roger's planetoid—plunged into the rarefied outer atmosphere, and crimson beams of force tore shriekingly the thin air as it braked its terrific speed. A third of the circumference of Nevia's mighty globe was traversed before the velocity of the craft could be reduced sufficiently to make a landing possible. Then, approaching the twilight zone, the vessel dived vertically downward, and it became evident that Nevia was neither entirely aqueous nor devoid of intelligent life. For the blunt nose of the space-ship was pointing toward what was evidently a half-submerged city, a city whose buildings were flat-topped, hexagonal towers, exactly alike in size, shape, color, and material. These buildings were arranged as the cells of a honeycomb would be if each cell were separated from its neighbors by a relatively narrow channel of water, and all were built of the same white metal. Many bridges and more tubes extended through the air from building to building, and the watery "streets" teemed with surface craft, and with submarines.

The pilot, stationed immediately below the conical prow of the space-ship, peered intently through the thick windows of crystal-clear metal which afforded unobstructed vision in every direction except vertically upward and behind him. His four huge and contractile eyes were active, each operating independently in

sending its own message to his peculiar but capable brain. One was watching the instruments, the others scanned narrowly the immense, swelling curve of the ship's belly, the water upon which his vessel was to land, and the floating dock to which it was to be moored. Four hands—if hands they could be called—manipulated levers and wheels with infinite delicacy of touch, and with scarcely a splash the immense mass of the Nevian sky-wanderer struck the water and glided to a stop within a foot of its exact berth.

FOUR mooring bars dropped neatly into their sockets and the captain-pilot, after locking his controls in neutral, released his safety straps and leaped lightly from his padded bench to the floor. Scuttling across the floor and down a runway upon his four short, powerful, heavily scaled legs, he slipped smoothly into the water and flashed away, far below the surface. For Nevians are true amphibians. Their blood is cold; they use with equal comfort and efficiency gills and lungs for breathing; their scaly bodies are equally at home in the water or in the air; their broad, flat feet serve equally well for running about upon a solid surface or for driving their stream-lined bodies through the water at a pace few of our fishes can equal.

Through the water the Nevian commander darted along, steering his course accurately by means of his short, vaned tail. Through an opening in a wall he sped and along a submarine hallway, emerging upon a broad ramp. He scurried up the incline and into an elevator which lifted him to the top floor of the hexagon, directly into the office of the Secretary of Commerce of all Nevia.

"Welcome, Captain Neradol!" The Secretary waved a tentacular arm and the visitor sprang lightly upon a softly cushioned bench, where he lay at ease,

facing the official across his low, flat "desk." "We congratulate you upon the success of your final trial flight. We received all your reports, even while you were traveling with many times the velocity of light. With the last difficulties overcome, you are now ready to start?"

"We are ready," the captain-scientist replied, soberly. "Mechanically, the ship is as nearly perfect as our finest minds can make her. She is stocked for two years. All the iron-bearing suns within reach have been plotted. Everything is ready except the iron. Of course the Council refused to allow us any of the national supply—how much were you able to purchase for us in the market?"

"Nearly ten pounds. . . ."

"Ten pounds! Why, the securities we left with you could not have bought two pounds, even at the price then prevailing!"

"No, but you have friends. Many of us believe in you, and have dipped into our own resources. You and your fellow scientists of the expedition have each contributed his entire personal fortune; why should not some of the rest of us also contribute, as private citizens?"

"Wonderful—we thank you. Ten pounds!" The captain's great triangular eyes glowed with an intense violet light. "A full year of cruising. But . . . what if, after all, we should be wrong?"

"In that case you shall have consumed ten pounds or irreplaceable metal." The Secretary was unmoved. "That is the viewpoint of the Council and of almost everyone else. It is not the waste of treasure they object to; it is the fact that ten pounds of iron will be forever lost."

"A high price truly," the Columbus of Nevia assented. "And after all, I may be wrong."

"**Y**OU probably are—of course you are wrong," his host made a startling answer. "It is practically certain—it is almost a demonstrable mathematical fact—that no other sun within hundreds of thousands of light-years of our own has a planet. In all probability Nevia is the only planet in the entire Universe. We are the only intelligent life in the Universe. But there is one chance in numberless millions that, somewhere with the cruising range of your newly perfected space-ship, there may be an iron-bearing planet upon which you can effect a landing, and it is upon that infinitesimal chance that some of us are staking a portion of our wealth. We expect no return whatever, but if you *should* by some miracle happen to find stores of iron somewhere in space, what then? Deep seas being made shallow, civilization extending itself over the globe, science advancing by leaps and bounds, Nevia becoming populated as she should be peopled—that, my friend, is a chance well worth taking!"

The Secretary called in a group of guards, who escorted the small package of priceless metal to the space-ship, and before the massive door was sealed the friends bade each other farewell.

". . . I will keep in touch with you on the ultra-wave," the Captain concluded. "After all, I do not blame the Council for refusing to allow the other ship to go with us. Ten pounds of iron will be a fearful loss to the world. If we *should* find iron, however, see to it that the other vessel loses no time in following us."

"No fear of that! If you find iron all space will be full of vessels, as soon as they can possibly be built—good-bye!"

The last opening was sealed and Nerrado shot the great vessel into the air. Up and up, out beyond the last tenuous trace of atmosphere, on and on through

space it flew with ever-increasing velocity until Nevia's gigantic blue sun had been left so far behind that it became a splendid blue-white star. Then, projectors cut off to save the precious iron whose disintegration furnished them power, for week after week Captain Nerado and his venturesome crew of scientists drifted idly through the illimitable void. Sun after sun, as visible in their ultra-instruments as though the flying vessel were moving slower than light, they studied without finding a single planet.

Three months passed. Nerado had already applied the slight power which was to swing the vessel around in an immense circle, back toward his native world. In that course he was rapidly approaching a sun, an ordinary G-type dwarf, whose spectrum revealed a blaze of lines of the precious element for which he was searching. Now at close observing range—he had long since abandoned his former eager habit of studying a sun as soon as it showed the tiniest perceptible disk in his most powerful telescope—he turned on his powerful visiray beam without enthusiasm, swung it upon that very commonplace sun, and shrieked aloud in exultation. Not only one planet had that yellowish luminary—it had six, seven, eight; yes, possibly nine or ten; and several of those planets were themselves apparently centers of attraction around which were circling other tiny worlds! Nerado thrilled with joy as he applied a full retarding force, and every creature aboard that great vessel had to peer into a plate or through a telescope, before he could believe that planets other than Nevia did in reality exist!

VELOCITY checked to the merest crawl, as space-speed goes, and with electro-magnetic detector screens full out, the Nevia vessel crept toward our sun. Finally the detectors encountered

an obstacle, a conductive substance which the patterns showed conclusively to be practically pure iron. Iron—an enormous mass of it—floating alone out in space! Without waiting to investigate the nature, appearance, or structure of the precious mass, Nerado ordered power into the converters and drove an enormous softening field of force upon the object—a force of such a nature that it would condense the metallic iron into an allotropic modification of much smaller bulk; a red, viscous, extremely dense and heavy liquid which could be stored conveniently in his tanks.

No sooner had the precious fluid been stored away than the detectors again broke into an uproar. In one direction was an enormous mass of iron, scarcely detectable; in another a great number of smaller masses; in a third an isolated mass, comparatively small in size. Space seemed to be full of iron, and Nerado drove his most powerful beam toward distant Nevia and sent an exultant message.

"We have found iron—easily obtained and in unthinkable quantity—not in fractions of milligrams, but in millions upon unmeasured millions of tons! Send our sister ship here as once!"

"Nerado!" The captain was called to one of the observation plates as soon as he had opened his key. "I have been investigating the mass of iron now nearest us, the small one. It is an artificial structure, a small space-boat, and there are three creatures in it—monstrosities certainly, but they must possess some intelligence or they could not be navigating space."

"What? Impossible!" exclaimed the chief explorer. "Probably, then, the other was—but no matter, we had to have the iron. Bring the boat in without converting it, so that we may study at our leisure both the beings and their

mechanisms," and Nerado swung his own visiray beam into the emergency boat, seeing there the armored figures of Clio Marsden and the two Triplanetary officers.

"They are indeed intelligent," Nerado commented, as he detected and silenced Costigan's ultra-beam communicator. "Not, however, as intelligent as I had supposed," he went on, after studying the peculiar creatures and their tiny space-ship more in detail. "They have immense stores of iron, yet use it for nothing other than building material. They apparently have a rudimentary knowledge of ultra-waves, but do not use them intelligently—they cannot neutralize even these ordinary forces we are now employing. They are of course more intelligent than the lower ganoids, or even than some of the higher fishes, but by no stretch of the imagination can they be compared to us. I am quite relieved—I was afraid that in my haste I might slay members of a highly developed race."

THE helpless boat, all her forces neutralized, was brought up close to the immense flying fish. There flaming knives of force sliced her neatly into sections and the three rigid armored figures, after being bereft of their external weapons, were brought through the airlocks and into the control room, while the pieces of their boat were stored away for future study. The Nevian scientists first analyzed the air inside the space-suits of the Terrestrials, then removed without ado the protective covering of the captives.

Costigan—fully conscious through it all and now able to move a little, since the peculiar temporary paralysis was wearing off—braced himself for he knew not what shock, but it was needless; their grotesque captors were not torturers. The air, while somewhat less

dense than earth's and of a peculiar odor, was eminently breathable, and even though the vessel was motionless in space, an almost-normal gravitation gave them a large fraction of their usual weight. The space suits were removed with care, and after the three had been relieved of their pistols and other articles which the Nevians thought might prove to be weapons, the strange paralysis was lifted entirely. The earthly clothing puzzled the captors immensely, but so strenuous were the objections raised to its removal, but they did not press the point, but fell back to study their find in detail.

Then faced each other the representatives of the civilizations of two widely separated solar systems. The Nevians studied the human beings with interest and curiosity blended largely with loathing and repulsion; the three Terrestrials regarded the unmoving, expressionless "faces"—if those coned heads could be said to possess such things—with horror and disgust, as well as with other emotions, each according to his type and training. For to human eyes the Nevian is a fearful thing. Even to-day there are few Terrestrials—or Solarians for that matter—who can look at a Nevian, eye to eye, without feeling a creeping of the skin and experiencing a "gone" sensation in the pit of the stomach. The horny, wrinkled, drought-resisting Martian, whom we all know and rather like, is a hideous being indeed. The bat-eyed, colorless, hairless, practically skinless Venerian is worse. But they both are, after all, remote cousins of Terra's humanity, and we get along with them quite well whenever we are compelled to visit Mars or Venus. But the Nevians—

THE horizontal, flat, fish body is not so bad, even supported as it is by four, short, powerful, scaly, flat-footed legs; and terminating as it does in the

weird, four-vaned tail. The neck, even, is endurable, although it is long and flexible, heavily scaled, and is carried in whatever eye-wringing loops, knots, or angles the owner considers most convenient or ornamental at the time. Even the smell of a Nevian—a maladorous reek of over-ripe fish—does in time become tolerable, especially if sufficiently disguised with creosote, which purely Terrestrial chemical is the most highly prized perfume of Nevia. But the head! It is that member that makes the Nevian so appalling to earthly eyes, for it is a thing utterly foreign to all Solarian history or experience. As most Tellurians already know, it is fundamentally a massive cone, covered with scales, based spearhead-like upon the neck. Four great sea-green, triangular eyes are spaced equidistant from each other about half way up the cone. The pupils are contractile at will, like the eyes of the cat, permitting the Nevian to see equally well in any ordinary extreme of light or darkness. Immediately below each eye springs out a long, jointless, boneless, tentacular arm; an arm which at its extremity divides into eight delicate and sensitive, but very strong, fingers. Below each arm is a mouth: a beaked, needle-tusked orifice of dire potentialities. Finally, under the overhanging edge of the cone-shaped head are the delicately frilled organs which serve either as gills or as nostrils and lungs, as may be desired. To other Nevians the eyes and other features are highly expressive, but to us they appear utterly cold and unmoving. Terrestrial senses can detect no changes of expression in a Nevian's "face." Such were the frightful beings at whom the three prisoners stared with sinking hearts.

But if we human beings have always considered Nevians grotesque and repulsive, the feeling has always been mutual. For those "monstrous" beings

are a highly intelligent and extremely sensitive race, and our—to us—trim and graceful human forms seems to them the very quintessence of malformation and hideousness.

"Good Heavens, Conway!" Clio exclaimed, shrinking against Costigan as his left arm flashed around her. "What monstrosities! And they can't talk—not one of them has made a sound—suppose they can be deaf and dumb?"

But at the same time Nerado was addressing his fellows.

"What hideous, deformed creatures they are! Truly a low form of life, even though they do possess some intelligence. They cannot talk, and have made no signs of having heard our words to them—do you suppose that they communicate by sight? That those weird contortions of their peculiarly placed organs serve as speech?"

Thus both sides, neither realizing that the other had spoken. For the Nevian voice is pitched so high that the lowest note audible to them is far above our limit of hearing. The shrillest note of a Terrestrial piccolo is to them so profoundly low that it cannot be heard.

"We have much to do." Nerado turned away from the captives. "We must postpone further study of the specimens until we have taken aboard a full cargo of the iron which is so plentiful here."

"What shall we do with them, sir?" asked one of the Nevian officers. "Lock them in one of the storage rooms?"

"OH, no! They might die there, and we must by all means keep them in good condition, to be studied most carefully by the fellows of the College of Science. What a commotion there will be when we bring in this group of strange creatures, living proof that there are other suns possessing planets; planets which are supporting organic and intel-

ligent life! You may put them in three communicating rooms, say in the fourth section—they will undoubtedly require light and exercise. Lock all exits, of course, but it would be best to leave the doors between the rooms unlocked, so that they can be together or apart, as they choose. Since the smallest one, the female, stays so close to the larger male, it may be that they are mates. But since we know nothing of their habits or customs, it will be best to give them all possible freedom compatible with safety."

Nerado turned back to his instruments and three of the frightful crew came up to the human beings. One walked away, waving a couple of arms in an unmistakable signal that the prisoners were to follow him. The three obediently set out after him, the other two guards falling behind.

"Now's our best chance!" Costigan muttered, as they passed through a low doorway and entered a narrow corridor. "Watch that one ahead of you, Clio—hold him for a second if you can. Bradley, you and I'll take the two behind us—now!"

Costigan stopped and whirled. Seizing a cable-like arm, he pulled the outlandish head down, the while the full power of his mighty right leg drove a heavy service boot into the place where scaly neck and head joined. The Nevian fell, and instantly Costigan leaped at the leader, ahead of the girl. Leaped; but dropped to the floor, again paralyzed. For the Nevian leader had been alert, his four eyes covering the entire circle of vision, and he had acted rapidly. Not in time to stop Costigan's first Berserk attack—the First Officer's reactions were practically instantaneous and he moved like chain lightning—but in time to retain command of the situation. Another Nevian appeared and, while the stricken guard was recovering, all four

arms wrapped tightly around his convulsively looping, knotting neck, the three helpless Terrestrials were lifted into the air and carried bodily into the quarters to which Nerado had assigned them. Not until they had been placed upon cushions in the middle room and the heavy metal doors had been locked upon them did they again find themselves able to use arms or legs.

"Well, that's another round we lose," Costigan commented, cheerfully. "A guy can't mix it very well when he can neither kick, strike, nor bite. I expected those lizards to rough me up, but they didn't."

"They don't want to hurt us. They want to take us home with them, wherever that is, as curiosities, like wild animals or something," decided the girl, shrewdly. "They're pretty bad, of course, but I like them a lot better than I do Roger and his robots, anyway."

"I think you have the right idea, Miss Marsden," Bradley rumbled. "That's it, exactly. I feel like a bear in a cage. I should think you'd feel worse than ever. What chance has an animal of escaping from a menagerie?"

"These animals, lots. I'm feeling better and better all the time," Clio answered, and her serene bearing bore out her words. "You two got us out of that horrible place of Roger's, and I'm pretty sure that you will get us away from here, somehow or other. They may think we're stupid animals, but before you two and the Secret Service get done with them they'll have another think coming."

"**T**HAT'S the old fight, Clio!" cheered Costigan. "I haven't got it figured out as close as you have, but I see you, eye to eye. These four-legged fish carry considerably heavier stuff than Roger did, I'm thinking; but they'll be up against something themselves pret-

ty quick, that is NO light-weight, believe me!"

"Do you *know* something, or are you just whistling in the dark?" Bradley demanded.

"I know a little; not much. The Science Service has been working on a new ship for a long time; a ship to travel so much faster than light that it can go anywhere in the Galaxy and back in a month or so. New sub-ether drive, new power, new armament, new everything. Only bad thing about it is that it doesn't work so good yet—it's fuller of "bugs" than a Venerian's kitchen. It has blown up five times that I know of, and has killed twenty-nine men. But when they get it licked they'll *have something!*"

"When, or if?" asked Bradley, pessimistically.

"I said *when!*" snapped Costigan, his voice cutting like a knife. "When that gang goes after anything they get it, and when they get it it stays. . . ." He broke off abruptly and his voice lost its edge. "Sorry. Didn't mean to get high, but I think we'll have help, if we can keep our heads up a while. And it looks good—these are first-class cages they've given us. All the comforts of home, even to lookout plates. Let's see what's going on, shall we?"

After some experimenting with the unfamiliar controls Costigan learned how to operate the Nevian visiray, and upon the plate they saw the Cone of Battle hurling itself toward Roger's planetoid. They saw the pirate fleet rush out to do battle with Triplanetary's massed forces, and with bated breath they watched every maneuver of that epic battle to its savagely sacrificial end. And that same battle was being watched, also with intense interest, by the Nevians.

"IT is indeed a blood-thirsty combat," mused Nerado at his observation

plate. "And it is peculiar—or rather, probably only to be expected from a race of such a low stage of development—that they employ only ether-borne forces. Warfare seems universal among primitive types—indeed, it is not so long ago that our own cities, few in number though they are, ceased fighting each other and combined against the semi-civilized fishes of the greater deeps."

He fell silent, and for many minutes watched the furious battle between the two navies of the void. That conflict ended, he watched the Triplanetary fleet reform its battle cone and rush upon the planetoid.

"Destruction, always destruction," he sighed, adjusting his power switches. "Since they are bent upon mutual destruction I can see no purpose in restraining from destroying all of them. We need the iron, and they are a useless race."

He launched his softening, converting field of dull red energy. Vast as that field was, it could not encompass the whole of the fleet, but half of the lip of the gigantic cone soon disappeared, its component vessels subsiding into a sluggishly flowing stream of allotropic iron. Instantly the fleet abandoned the attack upon the planetoid and swung its cone around, to bring the flame-erupting axis to bear upon the inchoate something dimly perceptible to the ultra-vision of the Secret Service observers. Furiously the gigantic composite beam of the massed fleet was hurled, nor was it alone.

FOR Roger in his floating citadel had realized at once that something untoward was happening; something altogether beyond even his knowledge and experience. He could not see anything—space was apparently empty—but he took his rays off the battleships and directed his every force just beyond the

point in space where that red stream of transformed metal was disappearing. Then, for the first time in Triplanetary history, the forces of law and order joined hands with those of piracy and banditry against a common foe. Rods, beams, planes, and stilettos of unbearable energy the doomed fleet launched, in addition to its main beam of annihilation, and Roger also hurled out into space every weapon at his command. Bombs, high-explosive shells, and deadly radio-dirigible torpedoes—all alike disappeared ineffective in that redly murky veil of nothingness. And the fleet was being melted. In quick succession the vessels flamed red, shrank together, gave out their air, and merged their component iron into the intensely red, sullenly viscous stream which was flowing through the impenetrable veil upon which Triplanetarians and pirates alike were directing their every possible weapon of offense.

The last vessel of the Triplanetary armada converted and the resulting metal stored away in their capacious reservoirs, the Nevians turned their attention upon the stronghold of the pirates. There ensued a battle royal. For this vast planetoid was no feeble warship, depending solely upon the limited power available in its accumulators. It was the product of a really mighty brain, a brain re-enforced by the many perverted but powerful intellects which Roger had won over to his cause. It was powered by the incalculable force of cosmic radiation, powered to drive its unimaginable mass through space, against any possible attractions, for an indefinite number of years. It was armed and equipped to meet any emergency which Roger's coldly analytical mind had been able to foresee.

The fact that the scientists of the Secret Service had discovered ultrawaves as yet unknown to him was un-

fortunate. That Service was itself unfortunate—impenetrable as it was, and incorruptible. He could learn nothing whatever about it. He had heard vague rumors of certain experiments—but even if they should discover something it would be too late to do them any good. Even without invisibility he would have no trouble in annihilating the massed Grand Fleet of the Triplanetary League. He would very shortly collect his tribute and disappear. And this new enemy, himself invisible and armed with heretofore unknown weapons of dire power, who was apparently unaffected by his beams—even he would discover that Roger the Great was no puny opponent. He would analyze those unknown forces, regenerate them, and hurl them back upon their senders.

THINKING thus, the man of gray sat coldly motionless at his great multi-shielded desk, whose top was now swung up to become a board of massed and tiered instruments and controls. He shut off his offensive beams and surrounded the entire planetoid with the peculiarly rigid and substantial shield which had so easily warded off Costigan's fiercest attacks. And that shield was more effective than even its designer had supposed—gray Roger had builded even better than he knew. For the voracious and all-powerful converting beam of the Nevians, below the level of the ether though it was, struck that perfectly transparent wall and rebounded, defeated and futile. Struck and rebounded, then struck and clung hungrily, licking out over that impermeable surface in darting tongues of red flame as the surprised Nerado doubled and then quadrupled his power. Fiercer and fiercer drove in the Nevian flood of force until the whole immense globe of the planetoid was one scintillant ball of scarlet energy, but still the pirates' shield

remained intact—at what awful drain of resource, Roger alone knew.

"Here is the analysis of his screen, sir." A Nevian computer handed his chief a sheet of metal, upon which were engraved rows of symbols.

"Ah, a sixth-phase polycyclic. A screen of that type was scarcely to have been expected from such a low form of life," Nerado commented, and rapidly adjusted the many dials and switches before him.

As he did so the character of the clinging mantle of force changed. From red it flamed quickly through the spectrum, became unbearably violet, then disappeared; and as it disappeared the shielding wall began to give way. It did not cave in abruptly, but softened locally, sagging into a peculiar grouping of valleys and ridges—contesting stubbornly every inch of position lost. And gray Roger knew that the planetoid was doomed. His supposedly impregnable screen was failing in spite of its utmost measure of energy, and, that defense down, the citadel would not last a minute. Therefore he summoned a chosen few of his motley crew of renegade scientists and issued brief instructions. For minutes a host of robots toiled mightily, then a portion of the shield bulged out, extended into a tube beyond the attacking layers of force, and from it there erupted a beam of violence incredible. A beam behind which was every volt and ampere that the gigantic generators and accumulators of the planetoid could yield. A beam that tore screamingly through the ether; that by the very vehemence of its incalculable energy tore a hole through the redly impenetrable Nevian field and hurled itself upon the inner screen of the fish-shaped cruiser in frenzied incandescence. And was there, or was there not, a lesser eruption upon the other side—an almost imperceptible flash, as though something

had shot from the doomed planetoid out into space?

NERADO'S looped neck straightened convulsively as his tortured drivers whined and shrieked at the terrific overload; but Roger's effort was far too intense to be long maintained. Even before his accumulators failed, generator after generator burned out, the defensive screen collapsed, and the red converter beam attacked voraciously the unresisting metal of those prodigious walls. Soon there was a terrific explosion as the pent-up air of the planetoid broke through its weakening container, and the sluggish river of allotropic iron flowed in an ever larger stream, ever faster.

"It is well that we had an unlimited supply of iron," Nerado tied a knot in his neck and spoke in huge relief. "With but the seven pounds remaining of our original supply, I fear that it would have been difficult to parry that last thrust."

"Difficult?" asked the second in command. "We would now be swimming in space. But what shall I do with this iron? Our reservoirs will not hold it all."

"Seal up one or two of the lower storage compartments, to make room for this lot. Immediately it is loaded, we return to Nevia. There we shall install reservoirs in all the spare space, and come back here for more."

The last drop of the precious liquid secured, the vessel moved away, sluggishly now because of its prodigious load. In their quarters in the fourth section the three Terrestrials, who had watched with strained attention the downfall and absorption of the planetoid, stared at each other with drawn faces. Clio broke the silence.

"Oh, Conway, this is ghastly! It's . . . it's just simply perfectly horrible!" she gasped, then recovered a measure of her customary spirit as she stared in

surprise at Costigan's face. For it was thoughtful, his eyes were bright and keen—no trace of fear or disorganization was visible in any line of his hard young face.

"It's not so good," he admitted frankly. "I wish I wasn't such a dumb cluck—if Lyman Cleveland or Ford Rodebush were here they could help a lot, but I don't know enough about any of their stuff to flag a hand-car. I can't even interpret that funny flash—if it really was a flash—that we saw."

"Why bother about one little flash, after all that really did happen?" asked Clio, curiously.

"You think Roger launched something? He couldn't have—I didn't see a thing," Bradley argued.

"I don't know what to think. I've never seen anything material sent out so fast that I couldn't race it with an ultra-wave—but on the other hand, Roger's got a lot of stuff that I never saw anywhere else. However, I don't see that it has anything to do with the fix we're in right now—but at that, we might be worse off. We're still breathing air, you notice, and if they don't blanket my wave I can still talk."

HE put both hands in his pockets and spoke.

"Samms? Costigan. Put me on a recorder, quick—I probably haven't got much time," and for ten minutes he talked, concisely and as rapidly as he could utter words, reporting clearly and exactly everything that had transpired. Suddenly he broke off, writhing in agony. Frantically he tore his shirt open and hurled a tiny object across the room.

"Wow!" he exclaimed. "They may be deaf, but they can certainly detect an ultra-wave, and the interference they can set up on it is enough to pulverize your bones. No, I'm not hurt," he re-

sured the anxious girl, now at his side. "but it's a good thing I had you out of circuit—it would have jolted you loose from six or seven of your back teeth."

"Have you any idea where they're taking us?" she asked, soberly.

"No," he answered flatly, looking deep into her steadfast eyes. "No use lying to you—if I know you at all you'd rather take it standing up. That talk of Jovians or Neptunians is the bunk—nothing like that ever grew in our Solarian system. All the signs say that we're going for a long, long ride!"

CHAPTER V

Nevian Strife

THE Nevian space-ship was hurtling upon its way. Space-navigators both, the two Terrestrial officers soon discovered that it was even then moving with a velocity far above that of light and that it must be accelerating at a stupendous rate, even though to them it seemed stationary—they could feel only a gravitational force somewhat less than that of their native earth.

Bradley, seasoned old campaigner that he was, had retired promptly as soon as he had completed a series of observations, and was sleeping soundly upon a pile of cushions in the first of the three inter-connecting rooms. In the middle room, which was to be Clio's, Costigan was standing very close to the girl, but was not touching her. His body was rigid, his face was tense and drawn.

"You are wrong, Conway; all wrong," Clio was saying, very seriously. "I know how you feel, but it's false chivalry."

"That isn't it, at all," he insisted, stubbornly. "It isn't only that I've got you out here in space, in danger and alone, that's stopping me. I know you and I know myself well enough to know that what we start now we'll go through with

for life. It doesn't make any difference, that way, whether I start making love to you now or whether I wait until we're back on Tellus—I've been telling you for half an hour that for your own good you'd better pass me up entirely. I've got enough horsepower to keep away from you if you tell me to—not otherwise."

"I know it, both ways, dear, but . . ."

"But nothing!" he interrupted. "Can't you get it into your skull what you'll be letting yourself in for if you marry me? Assume that we get back, which isn't sure, by any means. But even if we do, some day—and maybe soon, too, you can't tell—somebody is going to collect fifty grams of radium for my head."

"Fifty grams—and everybody knows that Samms himself is rated at only sixty? I *knew* that you were somebody, Conway!" Clio exclaimed, undeterred. "But at that, something tells me that any pirate will earn even that much reward several times over before he collects it. Don't be silly, dear heart—good-night."

She tipped her head back, holding up to him her red, sweetly curved, smiling lips, and his eager arms, hitherto kept away from her by sheer force of will, swept around her in almost fierce intensity. As his hot lips met hers, her arms crept up around his neck and they stood, clasped together in the motionless ecstasy of love's first embrace.

"Girl, girl, how I love you!" Costigan's voice was husky, his usually hard eyes were glowing with a tender light. "That settles that. I'll really *live* now, anyway, while . . ."

"Stop it!" she commanded, sharply. "You're going to live until you die of old age—see if you don't. You'll simply have to, Conway!"

"That's so, too—no percentage in dying now. All the pirates between Tellus and Andromeda couldn't take me after this—I've got too much to live for. Well,

good-night, sweetheart, I'd better beat it—you need some sleep."

The lovers' parting was not as simple and straightforward a procedure as Costigan's speech would indicate, but finally he did seek his own room and relaxed upon a pile of cushions, his stern visage transformed. Instead of the low metal ceiling he saw a beautiful, oval, tanned young face, framed in a golden-blonde corona of hair. His gaze sank into the depths of loyal, honest, dark-blue eyes; and looking deeper and deeper into those blue wells he fell asleep. Upon his face, too, set and grim by far for a man of his years—the lives of Sector Chiefs of the T. S. S. are never easy, nor as a rule are they long—there lingered as he slept that newly acquired softness of expression, the reflection of his transcendent happiness.

FOR eight hours he slept soundly, as was his wont; then, also according to his habit and training, he came wide awake, with no intermediate stage of napping.

"Clio?" he whispered. "Awake, girl?"

"Awake!" Her voice came through the ultra-phone, relief in every syllable. "Good heavens, I thought you were going to sleep until we got to wherever it is that we're going! Come on in, you two—I don't see how you can possibly sleep, just as though you were home in bed."

"You've got to learn to sleep anywhere if you expect to keep in . . ." Costigan broke off as he opened the door and saw Clio's wan face. She had evidently spent a sleepless and wracking eight hours. "Good Lord, Clio, why didn't you call me?"

"Oh, I'm all right, except for being a little jittery. No need of asking how you feel, is there?"

"No—I feel hungry," he answered

cheerfully. "I'm going to see what we can do about it—or say, guess I'll see whether they're still interfering on Samms' wave."

He took out a small, insulated case and touched the contact stud lightly with his fingers. His arm jerked away powerfully.

"Still at it," he gave the necessary explanation. "They don't seem to want us to talk outside, but his interference is as good as my talking—they can trace it, of course. Now I'll see what I can find out about our breakfast."

He stepped over to the plate and shot its projector beam forward into the control room, where he saw Nerado lying, doglike, at his instrument panel. As Costigan's beam entered the room a blue light flashed on and the Nevian turned an eye and an arm toward his own small observation plate. Knowing that they were now in visual communication, Costigan beckoned an invitation and pointed to his mouth in what he hoped was the universal sign of hunger. The Nevian waved an arm and fingered controls, and as he did so a wide section of the floor of Clio's room slid aside. The opening thus made revealed a table which rose upon its low pedestal, a table equipped with three softly cushioned benches and spread with a glittering array of silver and glassware. Bowls and platters of dazzlingly white metal, narrow-waisted goblets of sheerest crystal; all were hexagonal, beautifully and intricately carved or etched in apparently conventional marine designs. And the table utensils of this strange race were peculiar indeed. There were tearing forceps of sixteen needle-sharp curved teeth; there were flexible spatulas; there were deep and shallow ladles with flexible edges; there were many other peculiarly curved instruments at whose uses the Terrestrials could not even guess; all having delicately fashioned handles

to fit the long, slender fingers of the Nevians.

But if the table and its appointments were surprising to the Terrestrials, revealing as they did a degree of culture which none of them had expected to find in a race of beings so monstrous, the food was even more surprising, although in another sense. For the wonderful crystal goblets were filled with a grayish-green slime of a nauseous and overpowering odor, the smaller bowls were full of living sea spiders and other such delicacies; and each large platter contained a fish fully a foot long, raw and whole, garnished tastefully with red, purple, and green strands of seaweed!

CLIO looked once, then gasped, shutting her eyes and turning away from the table, but Costigan flipped the three fish into a platter and set it aside before he turned back to the visiplate.

"They'll go good fried," he remarked to Bradley, signaling vigorously to Nerado that the meal was not acceptable and that he wanted to talk to him, *in person*. Finally he made himself clear, the table sank down out of sight, and the Nevian commander cautiously entered the room.

At Costigan's insistence, he came up to the plate, leaving near the door three guards armed with projectors in instant readiness. The operative then shot the beam into the galley of the pirate's life-boat, suggesting that they should be allowed to live there. For some time the argument of arms and fingers raged—though not exactly a fluent conversation, both sides managed to convey their meanings quite clearly. Nerado would not allow the Terrestrials to visit their own ship—he was taking no chances—but after a thorough ultra-ray inspection he did finally order some of his men to bring into the middle room the electric range and a supply of Terrestrial food.

Soon the Nevian fish were sizzling in a pan and the appetizing odors of coffee and of browning biscuit permeated the room. But at the first appearance of those odors the Nevians departed hastily, content to watch the remainder of the curious and repulsive procedure in their visiray plates.

Breakfast over and everything made tidy and shipshape, Costigan turned to Clio.

"Look here, girl; you've got to learn how to sleep. You're all in. Your eyes look like you'd been on a Martian picnic and you didn't eat half enough breakfast. You've got to sleep and eat to keep fit. We don't want you passing out on us, so I'll put out this light, and you'll lie down here and sleep until noon."

"Oh, no; don't bother. I'll sleep to-night. I'm quite . . .

"You'll sleep now," he informed her, levelly. "I never thought of you being nervous, with Bradley and me on each side of you. We're both right here now, though, and we'll stay here. We'll watch over you like a couple of old hens with one chick between them. Come on; lie down and go bye-bye."

Clio laughed at the simile, but lay down obediently. Costigan sat upon the edge of the great divan, holding her hand, and they chatted idly. The silences grew longer, Clio's remarks became fewer, and soon her long-lashed lids fell and her deep, regular breathing showed that she was sound asleep. The man stared at her, his very heart in his eyes. So young, so beautiful, so lovely—and *how* he did love her! He was not formally religious, but his every thought was a sincere prayer. If he could only get her out of this mess . . . he wasn't fit to live on the same planet with her, but . . . just give him one chance, just one!

BUT Costigan had been laboring for days under a terrific strain, and had been going very short on sleep. Half hypnotized by his own mixed emotions and by his staring at the smooth curves of Clio's cheek, his own eyes closed and, still holding her hand, he sank down into the soft cushions beside her and into oblivion.

Thus sleeping hand-in-hand like two children Bradley found them, and a tender, fatherly expression came over his face as he looked down at them.

"Nice little girl, Clio," he mused, "and when they made Costigan they broke the mould. They'll do—about as fine a couple of kids as old Tellus ever produced. I could do with some more sleep myself." He yawned prodigiously, lay down at Clio's left, and almost instantly was himself asleep.

Hours later, both men were awakened by a merry peal of laughter. Clio was sitting up, regarding them with sparkling eyes. She was refreshed, buoyant, ravenously hungry and highly amused. Costigan was amazed and annoyed at what he considered a failure in a self-appointed task; Bradley was calm and matter-of-fact.

"Thanks for being such a nice body-guard, you two," Clio laughed again, but sobered quickly. "I slept wonderfully well, but I wonder if I can sleep to-night without making you hold my hand all night?"

"Oh, he doesn't mind doing that," Bradley commented.

"Mind it!" Costigan exclaimed, and his eyes and his tone spoke volumes that his tongue left unsaid.

They prepared and ate another meal, one to which Clio did full justice; and, rested and refreshed, had begun to discuss possibilities of escape when Nerado and his three armed guards entered the room. The Nevian scientist placed a box upon a table and began to make

adjustments upon its panels, eyeing the Terrestrials attentively after each setting. After a time a staccato burst of articulate speech issued from the box, and Costigan saw a great light.

"You've got it—hold it!" he exclaimed, waving his arms excitedly. "You see, Clio, their voices are pitched either higher or lower than ours—probably higher—and they've built an audio-frequency changer. He's nobody's fool, that fish!"

Nerado heard Costigan's voice; there was no doubt of that. His long neck looped and angled in Nevian gratification, and, although neither side could understand the other, both knew that intelligent speech and hearing were attributes common to the two races. This fact altered markedly the relations between captors and captives. The Nevians admitted among themselves that the strange bipeds might be quite intelligent, after all; and the Terrestrials at once became more hopeful.

"It isn't so bad, if they can talk," Costigan summed up the situation. "We might as well take it easy and make the best of it, particularly since we haven't been able to figure out any possible way of getting away from them. They can talk and hear, and we can learn their language in time. Maybe we can make some kind of a deal with them to take us back to our own system, if we can't make a break."

THE Nevians being as eager as the Terrestrials to establish communication, Nerado kept the newly devised frequency-changer in constant use. There is no need of describing at length the details of that interchange of languages. Suffice it to say that starting at the very bottom they learned as babies learn, but with the great advantage over babies of possessing fully developed and capable brains. And while the human beings were learning the tongue of Nevia, sev-

eral of the amphibians (and incidentally Clio Marsden) were learning Triplanetarian; the two officers knowing well that it would be much easier for the Nevians to learn the logically-built common language of the Three Planets than to master the senseless intricacies of English.

In a few weeks the two parties were able to understand each other after a fashion, by using a weird mixture of both languages. As soon as a few ideas had been exchanged, the Nevian scientists built transformers small enough to be worn collar-like by the Terrestrials, and the captives were allowed to roam at will throughout the great vessel; only the compartment in which was stored the dismembered pirate lifeboats being sealed to them. Thus it was that they were not left long in doubt, when another fish-shaped cruiser of the world was revealed upon their lookout plates in the awful emptiness of interstellar space.

"That is our sister-ship, going to your Solarian system for a cargo of the iron which is so plentiful there," Nerado explained to his involuntary guests.

"I hope the gang has got the bugs worked out of our super-ship" Costigan muttered savagely to his companions as Nerado turned away. "If they have, that outfit will get something more than a load of iron when they get there!"

More weeks passed; weeks during which a blue-white star separated itself from the infinitely distant firmament and began to show a perceptible disk. Larger and larger it grew, becoming bluer and bluer as the flying space-ship approached it, until finally Nevia could be seen, apparently close beside her parent orb.

Heavily laden though the vessel was, such was her power that she was soon dropping vertically toward a large lagoon in the middle of the Nevian city. That bit of open water was strangely devoid of life, for this was to be no ordinary

landing. Under the terrific power of the beams braking the descent of that unimaginable load of allotropic iron the water seethed and boiled; and instead of floating gracefully upon the surface of the sea, this time the huge ship of space sank like a plummet to the bottom. Having accomplished this delicate feat of docking the vessel safely in the immense cradle prepared for her, Nerado turned to the Terrestrials, who, now under guard, had been brought before him.

"While our cargo of iron is being discharged, I am to take you three Telurians to the College of Science, where you are to undergo a thorough physical and psychological examination. Follow me."

"Wait a minute!" protested Costigan, with a quick and furtive wink at his companions. "Do you expect us to go *through water*, and at this frightful depth?"

"Certainly," replied the Nevian, in surprise. "You are air-breathers, of course, but you must be able to swim a little, and this slight depth—but little more than thirty of your meters—will not trouble you."

"YOU are wrong, twice," declared the Terrestrial, convincingly. "If by 'swimming' you mean propelling yourself in or through the water, we know nothing of it. In water over our heads we drown helplessly in a minute or two, and the pressure at this depth would kill us instantly."

"Well, I could take a lifeboat, of course, but that . . ." The Nevian Captain began, doubtfully, but broke off at the sound of a staccato call from his signal panel.

"Captain Nerado, attention!"

"Nerado," he acknowledged into a microphone.

"The Third City is being attacked by the fishes of the greater deeps. They

have developed new and powerful mobile fortresses mounting unheard-of weapons and the city reports that it cannot long withstand their attack. The inhabitants are asking for all possible help. Your vessel not only has vast stores of iron, but also mounts weapons of power. You are requested to proceed to their aid at the earliest possible moment."

Nerado snapped out orders and the liquid iron fell in streams from wide-open ports, forming a vast, red pool in the bottom of the dock. In a short time the great vessel was in equilibrium with the water she displaced, and as soon as she had attained a slight buoyancy the ports snapped shut and Nerado threw on the power.

"Go back to your own quarters and stay there until I send for you," the Nevian directed, and as the Terrestrials obeyed the curt orders the fish-shaped cruiser of space tore herself from the water and flashed up into the crimson sky.

"What a barefaced liar!" Bradley exclaimed. The three, transformers cut off, were back in the middle room of their suite. "You can outswim an otter, and I happen to know that you came up out of the old DZ83 from a depth of . . ."

"MAYBE I did exaggerate a trifle," Costigan interrupted him, "but the more helpless he thinks we are the better for us. And we want to stay out of any of their cities as long as we can, because they may be hard places to escape from. I've got a couple of ideas, but they aren't ripe enough to pick yet. . . . Wow! how this bird's been traveling! We're there already! If he hits the water going like this, he'll split himself, sure!"

With undiminished velocity they were flashing downward in a long slant toward the beleaguered Third City, and from

the flying vessel there was launched toward the city's central lagoon a torpedo. No missile this, but a capsule containing a full ton of allotropic iron, which would be of more use to the Nevian defenders than millions of men. For the Third City was sore pressed indeed. Around it was one unbroken ring of boiling, exploding water—water billowing upward with searing, blinding bursts of superheated steam, or being hurled bodily in all directions in solid masses by the cataclysmic forces being released by the embattled fishes of the greater deeps. Her outer defenses were already down, and even as the Terrestrials stared in amazement another of the immense hexagonal buildings burst into fragments; its upper structure flying wildly into scrap metal, its lower half subsiding drunkenly below the surface of the boiling sea.

The three Terrestrials involuntarily seized whatever supports were at hand as the Nevian space-ship struck the water with undiminished speed, but the precaution was needless—Nerado knew thoroughly his vessel, its strength and its capabilities. There was a mighty splash, but that was all. The artificial gravity was unchanged by the impact; to the passengers the vessel was still motionless and on even keel as, now a submarine, she snapped around like a very fish and attacked the rear of the nearest fortress.

For fortresses they were; vast structures of green metal, plowing forward implacably upon immense caterpillar treads. And as they crawled they destroyed, and Costigan, exploring the strange submarine with his visiray beam, watched and marveled. For the fortresses were full of water; water artificially cooled and aerated, entirely separate from the boiling flood through which they moved. They were manned by fish some five feet in length. Fish with huge, goggling eyes; fish plentifully equipped

with long, armlike tentacles; fish poised before control panels or darting about intent upon their various duties. Fish with intelligent brains, waging desperate war upon a hated foe!

Nor was their warfare ineffectual. Their heat-rays boiled the water for hundreds of yards before them and their torpedoes were exploding against the Nevian defenses in one appallingly continuous concussion. But most potent of all was a weapon unknown to Triplaneary warfare. From a fortress there would shoot out, with the speed of a meteor, a long, jointed, telescopic rod, tipped with a tiny, brilliantly shining ball. Whenever this glowing tip encountered any obstacle, that obstacle disappeared in an explosion world-wracking in its intensity. Then what was left of the rod, dark now, would be retracted into the fortress—only to emerge again in a moment with a tip once more shining and potent.

NERADO, apparently as unfamiliar with the peculiar weapon as were the Terrestrials, attacked cautiously; sending out far to the fore his murkily impenetrable screens of red. But the submarine was entirely non-ferrous, and its officers were apparently quite familiar with the Nevian beams which licked at and clung to the green walls in impotent fury. Through the red veil came stabbing tiny ball after brilliant ball, and only the most frantic dodging saved the space-ship from destruction in those first few furious seconds. And now the Nevian defenders of the Third City had secured and were employing the vast store of allotropic iron so opportunely delivered by Nerado.

From the city there pushed out immense nets of metal, extending from the surface of the ocean to its bottom; nets radiating such terrific forces that the very water itself was beaten back

and stood motionless in vertical, glassy walls. Torpedoes were futile against that wall of energy. The most fiercely driven rays of the fishes flamed incandescent against it, in vain. Even the incredible violence of a concentration of every available force-ball against one point could not break through. At that unimaginable explosion water was hurled for miles. The bed of the ocean was not only exposed, but in it there was blown a crater at whose dimensions the Terrestrials dared not even guess. The crawling fortresses themselves were thrown backward violently and the very world was rocked to its core by the concussion, but that iron-driven wall held. The massive nets swayed and gave back, and tidal waves hurled their mountainously destructive masses through the Third City, but the mighty barrier remained intact. And Nerado, still attacking two of the powerful tanks with his every weapon, was still dodging those flashing balls charged with the quintessence of destruction. The fishes could not see through the sub-ethereal veil, but all the rod-guns of the two fortresses were combing it thoroughly with ever-lengthening, ever-thrusting rods, in a desperate attempt to wipe out the new and apparently all-powerful Nevian submarine, whose sheer power was slowly but inexorably crushing even their gigantic walls.

"Well, I think that right now's the best chance we'll ever have of doing something for ourselves." Costigan turned away from the absorbing scenes pictured upon the visiplate and faced his two companions.

"But what can we possibly do?" asked Clio, and

"Whatever it is, we'll try it!" Bradley exclaimed.

"Anything's better than staying here and letting them analyze us—no telling what they'd do to us," Costigan went on.

"I know a lot more about things than they think I do. They never did catch me using my spy-ray—it's on an awfully narrow beam, you know, and uses almost no power at all—so I've been able to dope out quite a lot of stuff. I can open most of their locks, and I know how to run their small boats. This battle, fantastic as it is, is deadly stuff, and it isn't one-sided, by any means, either, so that every one of them, from Nerado down, seems to be on emergency duty. There are no guards watching us, or stationed where we want to go—our way out is open. And once out, this battle is giving us our best possible chance to get away from them. There's so much emission out there already that they probably couldn't detect the driving rays of the lifeboat, and they'll be too busy to chase us, anyway."

"Once out, then what?" asked Bradley, eagerly.

"**W**E'LL have to decide that before we start, of course. I'd say make a break back for our own Solarian system. We know the direction, from our own observation, and we'll have plenty of power."

"But good Heavens, Conway, it's so far!" exclaimed Clio. "How about food, water, and air—would we ever get there?"

"You know as much about that as I do. I think so, but of course anything might happen. This ship is none too big, is considerable slower than the big space-ship, and we're a long ways from home. Another bad thing is the food question. The boat is well stocked according to Nevian ideas, but it's pretty foul stuff for us to eat. However, it's nourishing, and we'll have to eat it, since we can't carry enough of our own supplies to the boat to last long. Even so, we may have to go on short rations, but I think that we'll be able to make

it. On the other hand, what happens if we stay here? We will certainly strike trouble sooner or later, and we don't know any too much about these ultra-weapons. We are land-dwellers, and there is mighty little land on this planet. Then, too, we don't know where to look for what little land there is, and, even if we could find it, we know that it is all over-run with amphibians already. There's a lot of things that might be better, but they might be a lot worse, too. How about it? Do we try it or do we stay here?"

"We try it!" exclaimed Clio and Bradley as one.

"All right. I'd better not waste any more time talking—let's go!"

Stepping up to the locked and shielded door, he took out a peculiarly built torch and pointed it briefly at the Nevian lock. There was no light, no noise, but the massive portal swung smoothly open. They stepped out and Costigan relocked and reshielded the entrance.

"How . . . what . . . ?" Clio demanded, almost stuttering in her surprise.

"I've been going to school for the last few weeks," Costigan grinned, "and I've picked up quite a few things here and there—literally as well as figuratively speaking. Snap it up, guys! Our armor is stored away with the pieces of the pirates' lifeboat, and I'll feel a lot better when we've got it on and have hold of a few fresh Lewistons."

They hurried down corridors, up ramps, and along hallways, with Costigan's spy-ray investigating the course ahead for chance Nevians. Bradley and Clio were unarmed, but the secret agent had found a piece of flat metal and had ground it to a razor edge.

"I think I can throw this thing straight enough and fast enough to chop off a Nevian's head before he can put a paralyzing ray on us," he explained grimly,

but he was not called upon to show his skill with the improvised cleaver.

AS he had concluded from his careful survey, every Nevian was at some control or weapon, doing his part in that frightful combat with the denizens of the greater deeps. Their part was open, they were neither molested nor detected as they ran toward the compartment within which was sealed all their Terrestrial belongings. The door of that room opened, as had the other, to Costigan's knowing beam; and all three set hastily to work. They made up packs of food, filled their capacious pockets with emergency rations, recharged and buckled on Lewistons and automatics, donned their armor, and clamped into their external holsters a full complement of additional weapons.

"Now comes the ticklish part of the business," Costigan informed them. His helmet was slowly turning this way and that, and the others knew that through his spy-ray goggles he was studying their route. "There's only one boat we stand a chance of reaching, and somebody's mighty apt to see us. There's a lot of detectors up there, and we'll have to cross a corridor full of communicator beams. There, that line's off . . . scoot!"

At his word they dashed out into the hall and hurried along for minutes, dodging to right or left as the leader snapped out orders. Finally he stopped.

"Here's those beams I told you about. We'll have to roll under 'em. They're less than waist high—right there's the lowest one. Watch me do it, and when I give you the word, one at a time, you do the same. *Keep low*—don't let an arm or a leg get up into the path of a ray or they may see us."

He threw himself flat, rolled upon the floor a yard or so, and scrambled to his feet. He gazed intently at the blank wall for a space, then:

"Bradley—now!" he snapped, and the Interplanetary captain duplicated his performance.

But Clio, unused to the heavy and cumbersome space-armor she was wearing, could not roll in it with any degree of success. When Costigan barked his order she tried, but stopped, floundering, almost directly below the invisible network of communicator beams. As she struggled one mailed arm went up, and Costigan saw in his ultra-goggles the faint flash as the beam encountered the interfering field. But already he had acted. Crouching low, he struck down the arm, seized it, and dragged the girl out of the zone of visibility. Then in furious haste he opened a nearby door and all three sprang into a tiny compartment.

"Shut off all the fields of your suits, so that they can't interfere!" he hissed into the utter darkness. "Not that I'd mind killing a few of them, but if they start an organized search we're sunk. But even if they did get a warning by touching your glove, Clio, they probably won't suspect us. Our rooms are still shielded, and the chances are that they're too busy to bother much about us, anyway."

He was right. A few beams darted here and there, but the Nevians saw nothing amiss and ascribed the interference to the falling into the beam of some chance bit of charged metal. With no further misadventures the Terrestrials gained entrance to the Nevian lifeboat, where Costigan's first act was to disconnect one steel boot from his armor of space. With a sigh of relief he pulled his foot out of it, and from it carefully poured into the small power-tank of the craft fully thirty pounds of allotropic iron!

I PINCHED it off them," he explained, in answer to amazed and

inquiring looks, "and maybe you don't think it's a relief to get it out of that boot! I couldn't steal a flask to carry it in, so this was the only place I could put it in. These lifeboats are equipped with only a couple of grams of iron apiece, you know, and we couldn't get half-way back to Tellus on that, even with smooth going; and we may have to fight. With this much to go on, though, we could go to Andromeda, fighting all the way. Well, we'd better break away."

Costigan watched his plate closely, and, when the maneuvering of the great vessel brought his exit port as far away as possible from the Third City and the warring citadels of the deep, he shot the little cruiser out and away. Straight out into the ocean it sped, through the murky red veil, and darted upward toward the surface. The three wanderers sat tense, hardly daring to breathe, staring into the plates—Clio and Bradley pushing at metal levers and stepping down hard upon metal brakes in unconscious efforts to help Costigan dodge the beams and rods of death flashing so appallingly close upon all sides. Out of the water and into the air the darting, dodging lifeboat flashed in safety; but in the air, supposedly free from menace, came disaster. There was a crunching, grating shock and the vessel was thrown into a dizzy spiral, from which Costigan finally leveled it into headlong flight away from the scene of battle. Watching the pyrometers which recorded the temperature of the outer shell, he drove the lifeboat ahead at the highest safe atmospheric speed while Bradley went to inspect the damage.

"Pretty bad," but better than I thought," the captain reported. "Outer and inner plates broken away on a seam. Inter-wall vacuum all lost, and we wouldn't hold carpet-rags, let alone air. Any tools aboard?"

"Some—and what we haven't got we'll make," Costigan declared. "We'll put a lot of distance behind us, then we'll fix her up and get away from here."

"What are those fish, anyway, Conway?" Clio asked, as the lifeboat tore along. "The Nevians are bad enough, Heaven knows, but the very idea of intelligent and *educated* FISH is enough to drive one mad!"

"You know Nerado mentioned several times the 'semi-civilized fishes of the greater deeps'? he reminded her. "I gather that there are at least three intelligent races here. We know two—the Nevians, who are amphibians, and the fishes of the greater deeps. The fishes of the lesser deeps are also intelligent. As I get it, the Nevian cities were originally built in very shallow water, or perhaps were upon islands. The development of machinery and tools gave them a big edge on the fish; and those living in the shallow seas, nearest the islands, gradually became tributary nations, if not actually slaves. Those fish not only serve as food, but work in the mines, hatcheries, and plantations, and do all kinds of work for the Nevians. Those so-called 'lesser deeps' were conquered first, of course, and all their races of fish are docile enough now. But the deep-sea breeds, who live in water so deep that the Nevians can hardly stand the pressure down there, were more intelligent to start with, and more stubborn besides. But the most valuable metals here are deep down—this planet is very light for its size, you know—so the Nevians kept at it until they conquered some of the deep-sea fish, too, and put 'em to work. But those high-pressure boys were nobody's fools. They realized that as time went on the amphibians would get further and further ahead of them in development, so they let themselves be conquered, learned how to use the Nevians' tools and every-

thing else they could get hold of, developed a lot of new stuff of their own, and now they're out to wipe the amphibians off the slate completely, before they get too far ahead of them to handle."

"**A**ND the Nevians are afraid of them, and want to kill them all, as fast as they possibly can," guessed Clio.

"That would be the logical thing, of course," commented Bradley. "Got pretty nearly enough distance now, Costigan?"

"There isn't enough distance on the planet to suit me," Costigan replied. "We'll need all we can get. A full diameter away from that crew of amphibians is too close for comfort—their detectors are keen."

"Then they can detect us?" Clio asked. "Oh, I wish they hadn't hit us—we'd have been away from here long ago."

"So do I," Costigan assented, feelingly. "But they did—no use squawking. We can rivet and weld those seams and pump out the shell, and we'd have to fill our air-tanks to capacity for the trip, anyway. And things could be a lot worse—we are still breathing air!"

In silence the lifeboat flashed onward, and half of Nevia's mighty globe was traversed before it was brought to a halt, in the emptiest reaches of the planet's desolate and watery waste. Then in furious haste the two officers set to work, again to make their small craft sound and spaceworthy.

CHAPTER VI

Worm, Submarine, and Freedom

SINCE both Costigan and Bradley had often watched their captors at work during the long voyage from the Solar System to Nevia, they

were quite familiar with the machine tools of the amphibians. Their stolen lifeboat, being an emergency craft, of course carried full repair equipment; and to such good purpose did the two officers labor that even before their air-tanks were fully charged, all the damage had been repaired.

The lifeboat lay motionless upon the mirror-smooth surface of the ocean. Captain Bradley had opened the upper port and the three stood in the opening, gazing in silence toward the incredibly distant horizon, while powerful pumps were forcing the last possible ounces of air into the practically unbreakable storage cylinders. Mile upon strangely flat mile stretched that waveless, unbroken expanse of water, merging finally into the violent redness of the Nevian sky. The sun was setting; a vast ball of purple flame dropping rapidly toward the horizon. Darkness came suddenly as that seething ball disappeared, and the air became bitterly cold, in sharp contrast to the pleasant warmth of a moment before. And as suddenly clouds appeared in blackly banked masses and a cold, driving rain began to beat down in torrents.

"Br-r-r, it's cold! Let's go in—Oh! *Shut the door!*" Clio shrieked, and leaped wildly down into the compartment below, out of Costigan's way, for he and Bradley also had seen slithering toward them the frightful arm of the Thing.

Almost before the girl had spoken Costigan had leaped to the levers, and not an instant too soon; for the tip of that horrible tentacle flashed into the rapidly narrowing crack just before the door clanged shut. As the powerful toggles forced the heavy screw threads into engagement and drove the massive disk home into its bottle-tight, insulated seat, that grisly tip fell severed to the floor of the compartment and lay there, twitching and writhing with a loathsome and

unearthly vigor. Two feet long the piece was, and larger than a strong man's leg. It was armed with spiked and jointed metallic scales, and instead of sucking disks it was equipped with a series of *mouths*—mouths filled with sharp metallic teeth which gnashed and ground together furiously, even though sundered from the horrible organism which they were designed to feed.

The little submarine shuddered in every plate and member as monstrous coils encircled her and tightened inexorably in terrific, rippling surges eloquent of mastodonic power; and a strident vibration smote sickeningly upon Terrestrial eardrums as the metal spikes of the monstrosity crunched and ground upon the outer plating of their small vessel. Costigan stood unmoved at the plate, watching intently; hands ready upon the controls. Due to the artificial gravity of the lifeboat it seemed perfectly stationary to its occupants. Only the weird gyrations of the pictures upon the lookout screens showed that the craft was being shaken and thrown about like a rat in the jaws of a terrier; only the gauges revealed that they were almost a mile below the surface of the ocean already, and were still going downward at an appalling rate. Finally Clio could stand no more.

"Aren't you going to do something, Conway?" she cried.

"Not unless I have to," he replied, composedly. "I don't believe that he can really hurt us, and if I use a ray of any kind I'm afraid that it will kick up enough disturbance to bring Nerado down on us like a hawk after a chicken. However, if he takes us much deeper I'll have to go to work on him. We're getting down pretty close to our limit, and the bottom's a long way down yet."

DEEPER and deeper the lifeboat was dragged by its dreadful oppo-

net, whose spiked teeth still tore savagely at the tough outer plating of the craft until Costigan reluctantly threw in his power switches. Against the full propellant thrust the monster could draw them no lower, but neither could the lifeboat make any headway toward the surface. The Terrestrial then turned on his rays, but found that they were ineffective. So closely was the creature wrapped around the submarine that his weapons could not be brought to bear upon it without melting the vessel's own outer skin.

"What can it possibly be, anyway, and what can we do about it?" Clio asked.

"I thought at first it was something like a devilfish, or possibly an overgrown starfish, but it's too flat, and has no body that I can see," Costigan made answer. "It must be a kind of flat worm. That doesn't sound reasonable—the thing must be all of a hundred meters long—but there it is. The only thing left to do now, as I see it, is to try to boil him alive."

He closed other circuits, diffusing a terrific beam of pure heat, and the water all about them burst into furious clouds of steam. The boat leaped upward as the metallic fins of the gigantic worm fanned vapor instead of water, but the creature neither released its hold nor ceased its relentlessly grinding attack. Minute after minute went by, but finally the worm dropped limply away—cooked through and through; vanquished only by death.

"Now we've put our foot in it, clear to the knee!" Costigan exclaimed, as he shot the lifeboat upward at its maximum power. "Look at that! I knew that Nerado could trace us, but I didn't have any idea that *they* could. It's a good thing these ultra-vision plates don't need light to see by or we'd be '*spurlos versenkt*' in a hurry!"

Staring with Costigan into the plate,

Bradley and the girl saw, not the Nevian sky-rover they had expected, but a fast submarine cruiser, manned by the frightful fishes of the greater deeps. It was coming directly toward the lifeboat, and even as Costigan hurled the little vessel off at an angle and then upward into the air one of the deadly offensive rods, tipped with its glowing ball of pure destruction, flashed through the spot where they would have been had they held their former course.

But powerful as were the propellant forces and fiercely though Costigan applied them, the denizens of the deep clamped a tractor ray upon the flying vessel before it had gained a mile of altitude. Costigan aligned his every driving projector as his vessel came to an abrupt halt in the invisible grip of the beam, then experimented with various dials.

"There ought to be some way of cutting that beam," he pondered audibly, "but I don't know enough about their system to do it, and I'm afraid to monkey around with things too much, because I might accidentally release the screens we've already got out, and they're stopping altogether too much stuff for us to do without them right now."

He frowned as he studied the flaring defensive screens, now radiating an incandescent violet under the concentration of the forces being hurled against them by the warlike fishes, then stiffened suddenly.

"I thought so—they *can* shoot 'em!" he exclaimed, throwing the lifeboat into a furious corkscrew turn, and the very air blazed into flaming splendor as a dazzlingly scintillating ball of energy sped past them and high into the air beyond.

THEN for minutes a spectacular battle raged. The twisting, turning, leaping airship, small as she was

agile, kept on eluding the explosive projectiles of the fishes, and her screens neutralized and re-radiated the full power of the attacking beams. More—since Costigan did not need to think of sparing his iron, the ocean around the great submarine began furiously to boil under the full-driven offensive beams of the tiny Nevian ship. But escape Costigan could not. He could not cut that tractor beam and the utmost power of his drivers could not wrest the lifeboat from its tenacious clutch. And slowly but inexorably the ship of space was being drawn downward toward the ship of ocean's depths. Downward, in spite of the utmost possible effort of every projector and penetrator, and the two Terrestrial spectators, sick at heart, looked once at each other. Then they looked at Costigan, who, jaw hard set and eyes unflinchingly upon his plate, was concentrating his attack upon one turret of the green monster as they settled lower and lower.

"If this is . . . if our number is going up, Conway," Clio began, unsteadily.

"Not yet, it isn't!" he snapped. "Keep a stiff upper lip, girl. We're still breathing air, and the battle's not over yet!"

Nor was it; but it was not Costigan's efforts, mighty though they were, that ended the attack of the fishes of the greater deeps. The tractor beam snapped without warning, and so prodigious were the forces being exerted by the lifeboat that, as it hurled itself away, the three passengers were thrown violently to the floor, in spite of the powerful gravity controls. Scrambling up on hands and knees, bracing himself as best he could against the terrific forces, Costigan managed finally to force a hand up to his panel. He was barely in time; for even as he cut the driving power to its normal value the outer shell of the lifeboat was blazing at white heat from the friction of the atmosphere through

which it had been tearing with such an insane acceleration!

"Oh, I see—Nerado to the rescue," Costigan commented, after a glance into the plate. "I hope that those fish blow him clear out of the Galaxy!"

"Why?" demanded Clio. "I should think that you'd . . ."

"Think again," he advised her. "The worse Nerado gets licked the better for us. I don't really expect that, but if they can keep him busy long enough, we can get far enough away so that he won't bother about us any more."

As the lifeboat tore upward through the air at the highest permissible atmospheric velocity Bradley and Clio peered over Costigan's shoulders into the plate, watching in absorbed interest the scene which was being kept in focus upon it. The Nevian ship of space was plunging downward in a long, slanting dive, her terrific beams of force screaming out ahead of her. The rays of the little lifeboat had boiled the waters of the ocean; those of the parent craft seemed literally to blast them out of existence. All about the green submarine there had been volumes of furiously-boiling water and dense clouds of vapor; now water and fog alike disappeared, converted into transparent superheated steam by the blasts of Nevian energy. Through that tenuous gas the enormous mass of the submarine fell like a plummet, her defensive screens flaming an almost invisible violet, her every offensive weapon vomiting forth solid and vibratory destruction toward the Nevian cruiser so high in the angry, scarlet heavens.

FOR miles the submarine dropped, until the frightful pressure of the depth drove water into Nerado's beam faster than his forces could volatilize it. Then in that seething funnel there was waged desperate conflict. At that fun-

nel's wildly turbulent bottom lay the submarine, now apparently trying to escape, but held fast by the tractor rays of the space-ship; at its top, smothered almost to the point of invisibility by billowing masses of steam, hung poised the Nevian cruiser.

As the atmosphere had grown thinner and thinner with increasing altitude Costigan had regulated his velocity accordingly, keeping the outer shell of the vessel at the highest temperature consistent with safety. Now beyond measurable atmospheric pressure, the shell cooled rapidly and he applied full touring acceleration. At an appalling and constantly increasing speed the miniature space-ship shot away from the strange, red planet; and smaller and smaller upon the plate became its picture. Long since the great vessel of the void had plunged beneath the surface of the sea, more closely to come to grips with the vessel of the fishes; for a long time nothing of the battle had been visible save immense clouds of steam, blanketing hundreds of square miles of the ocean's surface. But just before the picture became too small to reveal details a few tiny dark spots appeared above the banks of cloud, now brilliantly illuminated by the rays of the rising sun—dots which might have been fragments of either vessel, blown bodily from the depths of the ocean and, riven asunder, hurled high into the air by the incredible forces at the command of the other.

Nevia a tiny moon and the fierce blue sun rapidly growing smaller in the distance, Costigan swung his visiray beam into the line of travel and turned to his companions.

"Well, we're off," he said, scowling. "I hope it was Nerado that got blown up back there, but I'm afraid it wasn't. He whipped two of those submarines that we know of, and probably half their fleet besides. There's no particular reason why that one should be able to take him, so it's my idea that we should get ready for great gobs of trouble."

"They'll chase us, of course; and I'm afraid that with their immense power, they'll catch us."

"But what can we do, Conway?" asked Clio.

"Several things," he grinned. "I managed to get quite a lot of dope on that paralyzing ray and some of their other stuff, and we can install the necessary equipment in our suits easily enough."

They removed their armor, and Costigan explained in detail the changes which must be made in the Triplanetary field generators. All three set vigorously to work—the two officers deftly and surely; Clio uncertainly and with many questions, but with undaunted spirit. Finally, having done all they could do to strengthen their position, they settled down to the watchful routine of the flight, with every possible instrument set to detect any sign of the pursuit they so feared.

END OF PART II



The Death Protozoan

By CLIFTON B. KRUSE

We have had stories involving protozoa in many of which the authors drew strongly upon their imagination, eliciting extraordinary, almost impossible adventures with these primitive creatures that are far down at the bottom of the list. Here the world of the minute beings is examined by what the author called "the eye," and the end brings about an impressive effect.

Illustrated by MOREY

CHAPTER I

The Traveling Eye

FOUR men were assembled in the imposing laboratory of Dr. Von Sinka at the extreme west of the city, a short walk from the Braddock Heights division. It was about nine in the morning of the seventeenth of July; a morning bright and slightly chill, certainly fitting for the momentous scientific adventure soon to be undertaken. There was Von Sinka himself, tall, suave and genially courteous, an excellent picture of middle aged dignity as he graciously received his three distinguished callers. First came Alfred of London, the zoologist, then Henderson from upper New York, botanist and naturalist of exceptional renown, and third, Herr Dr. Fritzmeier from Heidleburg, student of the life history of many protozoa of pathological interest. The field of Von Sinka included not only the flora and fauna of the lower orders, but also the study of mechanical aids approaching the two. There was little time wasted in reception and introductions, and after the lapse of a short while the four were grouped in the famous Von Sinka laboratory.

Von Sinka was speaking:

"Gentlemen, we are on the dawn of a new era in scientific research. Every progressive step in the scheme of man's existence has been preceded by the introduction of a new tool. I could give an almost endless list of examples but that would be both useless and tiresome. Suffice it to say that the beginning of intensive study and real progress in biology and its numerous branches followed upon the designing of the microscope and its resultant perfections. Although a great deal has been accomplished with the aid of this instrument, there are innumerable obstacles present in its use. Certainly it has its limitations. It will go so far and no farther and that distance is not great enough to meet the growing demands of science. We have need to be able to see and examine an object of minute proportions as distinctly as we see an object of proportions comparable to our own.

"Herr Fritzmeier, would it be of any advantage to you to be able to as safely and easily examine a pathological protozoan in your laboratory as you might a dog, or a man?"

"Ach, ja, but how? It would mean the saving of many lives."

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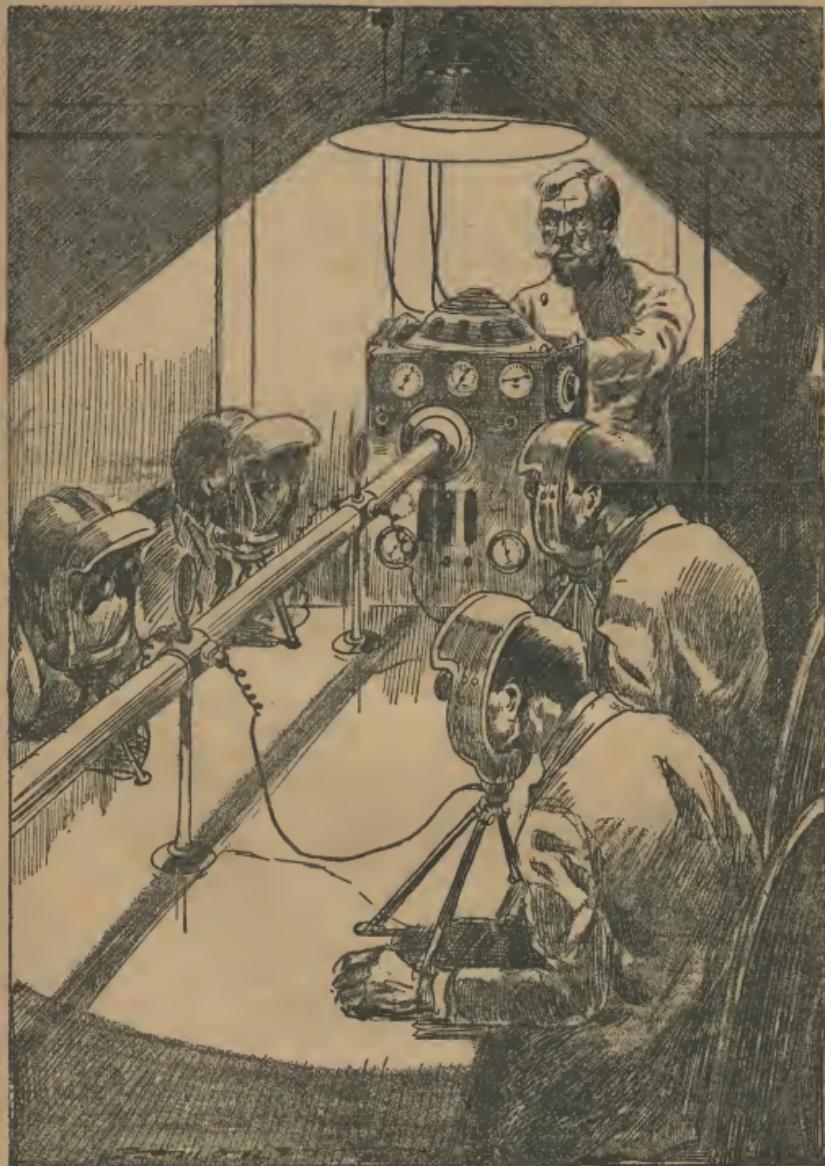
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By Bob Olsen



It was a thing of tubes, dials, and sundry other equipment, in all giving by its appearance no suggestion as to its nature or worth.

"Such a field of vision as you suggest, Von Sinka," interrupted Alfred, "would create a new era. Every day I find myself hampered for want of a clearer picture. But don't keep us waiting. What perfection in microscopes have you called us here to witness? I assure you, Von Sinka, we are breathless."

"It is not an improvement, gentlemen, rather it is an idea so novel, that I refuse to trust my own senses in its examination. I must have your reactions to it before I present it to the world."

At this juncture he arose and removed a cover from an elaborate instrument sitting just in front of a large laboratory table. It was a thing of tubes, dials, and sundry other equipment, in all giving by its appearance no suggestion as to its nature or worth. From a nearby cupboard Von Sinka procured a long, narrow tube of quartz glass which he fastened upon the apparatus in such a manner that it extended out across the large laboratory table for several feet. He then placed before each of the men an iron tripod stand, upon which were fastened mask-like arrangements in such a way, that when a man's chin was placed upon a protruding grooved metal plate the eyes were in focus with a small glass screen protected from outside light by the upper part of the mask. Von Sinka carefully showed each of his guests the correct method of holding the face to this mask in order to clearly see the screen. The rear of each mask was connected to the main part of the apparatus by means of long glass tubes and numerous metal wires. A similar arrangement was set up at a seat beside the controls for his own use.

"Before I begin this experiment I must tell you something about this instrument.

"One may not rightly speak of it as a

microscope for its design is based upon a totally different principle. You will not see an image cast from the bent rays of ordinary light, or rather any such procedure will not be a part of the basic factor of image transmission. I do employ magnification, but only after the image has been transferred from the eye of the instrument to the various receiving discs before you.

YOU will observe the long glass tube extending across the table here. It is elevated just two and a half feet above the table top and will from this position be enabled to throw its rays completely over the table and part of the room besides. The portions of the room which fall directly in the path of the light rays represent the total field of examination which may be studied without rearrangement of the apparatus. By operating the series of controls here before me in this cabinet I may inspect any microscopic point in the field just mentioned. Incidentally the same image will be conveyed to all of you as you look into the receiving masks before you."

"Then we will see and be able to follow, for a time at least, any microscopic body remaining within the direct flow of light from the long tube?"

"Yes, and that is precisely what I intend to demonstrate to you to-day."

"But," continued Henderson questioning, "where is the point of vision for the image? From the appearance of the tube itself no such arrangement is discernible."

"You are right, Henderson, no such point is discernible, at least not at present, for the reason that the point in question is composed of light rays from two sources meeting, rather than of metal or glass. Will you notice the crystal on* this cabinet, immediately in rear of the controls? This is the source of one

stream of light. Then at the far end of the long tube a half inch from where a group of wires are attached there is another crystal smaller in size but quite similar in design. Whenever the streams of light from these two crystals meet, the "eye" of our instrument is temporarily established. Furthermore at the very center of the crossing of the streams is our immediate field of vision.

"As soon as we shall begin our observations to-day you will each experience a decided shock. Incidentally this will attend our approach to the most notable feature of this invention. I am warning you now in order to save you needless concern in the next few moments. As you adjust the heavy receiving masks before your faces and observe the field of the adjustable "eye" of the cross-beams, you will immediately transcend into a new world. The power of vision is 'stepped down' to such an extent and in such a way, that you seemingly are of microscopic size yourself, traveling about a new little universe.

"However we will break into it gently. I want all of you gentlemen to adjust yourselves comfortably in your chairs and then pull the tripods towards you so that the mask just touches your faces. Now you will notice two small levers on each mask, one on each side. When the mask is right before you, pull each of these little levers. This causes folding leaves to protrude and cover the space between the face and the receiving screen.

"Now is everybody ready? Remember ask any questions as we go along. I am going to start at a low power and gradually increase the fineness of vision. The tube is glowing now, and each crystal is brightening up considerably. Their rays are about strong enough to strike out for the meeting. As soon as they meet we will begin our observations."

"There it is," exclaimed all the ob-

servers as one. The beams were established and were crossing a few inches above the table top. Each receiving plate glowed in response.

"At the present degree of transmission you will observe things much as though you were looking through an ordinary laboratory dissecting microscope of low magnification. That is why you discern nothing of distinct outline now while the beams are crossed in mid-air. air.

"**W**ILL you excuse me just a moment, while I adjust our medium of observation?" As he spoke Von Sinka by means of a crankshaft at the side of the table rolled the top of the table back into the far wall, thus exposing in the depression immediately below where the top had been an assembly of earth, sand and water, with an amazingly prolific growth in and upon it, of small plants principally certain Bryophytes and fungi. It was like a relief map of a small section of islands. Here was an island of earth, here one of sand, another of a coral like formation and so on. The water was not clear but seemed to be filled with algae of different types.

"This, gentlemen, is a bird's-eye view of the new world we are about to explore," and Von Sinka waved his hand suggestively towards the table. "We shall soon descend and see what sort of creatures abound herein. I have no precise idea myself, for this has been assembled rather haphazardly from numerous spots about the countryside here and with some material from the Zoological and the Botanical Departments thrown in."

"I believe now we are all ready to do some wonderful exploring. Let's go."

Slowly the cross-beams of light were lowered to the surface of the material.

CHAPTER II

Into the New World

IMEDIATELY there was the sensation of suspension in space. As though traveling by way of some transparent inter-spatial ship, the scientists visually entered into the new world. They were conscious not of observing from a distance but of actually being a part of this world of lesser proportions. So concentrated was the attention accorded by each observer, that in the laboratory room not a muscle moved, not a man stirred, save Von Sinka himself, as his fingers engaged in the delicate manipulation which guided the "eye."

Through a magnificent realm of pure space they sailed. There was a golden sunlight with its radiance everywhere as far as eye could see. It was not long before thousands of little masses of dark color were seen swarming through the space. To the scientists it appeared as though their "space ship" had moved forward into a region of asteroids. Only they were not orderly systems of little planets but rather were the swirling masses of dust particles that are invisible to the naked eye. On and on they sailed, their sturdy craft invulnerable to all collision.

There in the distance they noticed land, and moving swiftly yet with dexterous piloting, alighted upon the shore of a land which upon first glance appeared to be in the carboniferous age. There was a singular translucent characteristic of the vegetation near the water line. Indeed, near the shore there was little distinction between the land and the water plants. Long strands of sea weed were intertwined amid the gigantic boulders of silica. They trailed down into the lapping waves and seemed to have no end. Link after link of

great cells, their globules of red-brown pigment, easily discernible within the cell wall, moving in the simple circulation of plant-life characteristic of the brown algae. With unidue impatience this scene was left behind as the "eye" began its journey inland. It was not long before the ground became covered with carpets of an entrancing green. The flat, earth-hugging leaves of a Bryophyte appeared to be acres in extent. Certainly here was an unexplored land of wonderful peace and production. The monotony was broken here and there by hillocks, grayish white and incredibly soft. On and on sped the "eye" scarcely pausing at the new beauties of life in its moment of greatest simplicity. Another shore line was coming into view. Once more the boulders of brilliant silica, multicolored and scintillating in the light of Von Sinka's sun, stood out like jewels against the gray and green of the swamp mould. Here the land and water were closely intermingled. The land vista was heavily dotted with the myriad pools and rivulets and everywhere the algae, certain fungus growths living on the waste of the slime, and even numerous Bryophytes abounded. The great space of water adjoining this was an entanglement of growth. There was the green and the blue-green algae intermingled with the red, all making of the sea a forest.

SLOWLY, carefully and feasting on the scenic splendors as it traveled, the "eye" descended into the waters of this unexplored sea. The long algae vines, gently undulating in the slow movement of the water, were as great curtains swaying softly in a sluggish wind. The scene changed to the sand and shell-strewn sea bottom, and there were numerous clearances free of the intertwining algae, like little meadows

within a gigantic, forest of towering trees. There was animal life watching and feeding here—long, narrow, brown and translucent stalks with attentive, clutching tentacles at the top. These were the hydra monsters of the sea. Was it but a part of the coral and sand or a young sprig of some seaweed? Little amoeba would ask himself this question probably and then unwisely move too close to those swaying tentacles. Quick—in the barest fraction of time the sensitive tentacles were aware of the approaching food morsel. With disheartening swiftness a paralyzing dart was shot into the amoeboid body and greedy tentacles soon had encircled it. These indeed were the true fishermen. Rooted immovably to their chosen posts the hydra untiringly await the coming of a prey more cautious than careful. What drama here! Even among the infinitesimal there is the hunter and the hunted.

Von Sinka lifted his face from his viewing screen and looked towards his guests in order to inquire about their comfort and wishes. They were all unaware of his solicitude, not a head was lifted. Von Sinka smiled, well pleased with this attention. He would show them something yet. This was simple magnification compared to the still greater power of the "eye." He quietly arose and went to the far side of the laboratory, where he procured a well sealed flask. This would interest them, he thought to himself. A wonder among wonders. Less spectacular but certainly more terrifying.

CHAPTER III

The New Death Secret

VON SINKA cautiously opened the flask and poured the clear liquid contents upon a little pile of sand near the center of the microscopic table.

He returned at once to his seat at the control board and adjusted the viewing screen once more before his eyes.

The scene was still within the little underwater clearing near the community of hydras. Without show of undue haste the "eye" again resumed its course moving once more through the maze of algae. Out upon the shore and swiftly across the great Bryophyte field, and in their minds the men sailed across a continent. The "eye" was approaching higher land now. Towering boulders and mountains of silica were in terrifying relief. Now the rate of speed was diminishing, and soon the "eye" settled upon what was presumably the object of its swift flight.

"Protozoa," exclaimed Alfred, "but what a unique type."

Simple amoebas in general form yet extraordinarily ciliated, these creatures were a species of protozoa as yet unknown to man. Dr. Frietzmeir was almost beside himself with the intensity of his excitement.

"It is a type of pathological protozoa, to be sure," the German scientist exclaimed. "See the extraordinary and even sinister way the pseudopodia are thrust out in the securing of food. The ejected matter too is quite unlike that of the simple amoeba. Von Sinka, what have you here before us?"

There was an air of pride in Von Sinka's voice as he replied. "This, gentlemen, is what I am pleased to call the "death protozoan." I first observed it quite by accident as I was examining the intestines of a white mouse. Now comes the real treat for you. I am going to introduce a mouse in this part of the microscopic field and we shall observe the actions of the death protozoan as he attacks the animal."

So saying, Von Sinka again left his place beside the table and secured a small white mouse. This he placed on the

table near the spot infested with the "death protozoan." He then dropped bits of food about that area.

NO sooner had the mouse been placed near the creatures than they began to act curiously disturbed. Their cilia rose presenting a formidable array of quills upon each protozoan. They scattered with remarkable group-intelligence, and it was soon noticed that each bit of food in the vicinity had from one to a dozen of the protozoa upon it.

Von Sinka shifted the "eye" to the area before the mouth of the white mouse. The animal was sniffing the tempting odor of food and in a short while approached one of the morsels. The "eye" was stepped-down to correspond to the size of the protozoan lodged upon the bit of food. There was a swift and blurred shifting of scenes now, as Von Sinka strove to hold the "eye" upon the consumed food and protozoan.

In the churning and upheaval which accompanied the swallowing of the food the protozoan became separated from his edible craft, but that was to him of no concern, for, as soon as he had reached the mouth cavity of the mouse, his career in life was laid before him concisely. The contractions and flowing movements of the muscles of the throat of the mouth precipitated the protozoan quite forcibly down the dark channel of the aesophagus. It was a rare display of skill on the part of Von Sinka in his holding the "eye" on these irregular and spasmodic movements of the protozoan on this important journey of his life cycle. Nevertheless, his eyes burning upon the screen and every nerve and muscle taut, he followed every minute motion. Within the interior of the mouse the vision was quite noticeably hampered. Each of the men was hunched forward in his seat straining and miss-

ing no feature of the extraordinary performance.

Following the venturesome creature into the interior of the stomach of the mouse was a trip across a stormy, vicious ocean filled with water, bits of food, and the lashing, gastric juices. The protozoan fought the waves with the fury of a maniac. Its cilia whipped with maddening force against the heavy liquid, and the ectoderm presented an impregnable armor to the ravages of digestion.

At last the protozoan, safely ensconced within a crevice of the stomach lining, paused to refresh its strength and seemingly get its bearings—if ever mere protoplasm can be conscious of purpose. As it rested there it would send forth its pseudopodia here and there to gather in bits of food matter. It gorged itself and, having found fulfilment of appetite, shot forth the major portion of its body and proceeded to crawl about apparently seeking some suitable outlet from the roar and tumult of the stomach area.

From the stomach of the mouse the adventurer finally moved through a distended aperture into the adjoining intestine. Here its progress was unimpeded by the lashing waves characterizing the stomach. There was time to look about as it were and in a small way secure food and explore the well provisioned cavity at a leisurely gait. It was noted, however, that the wily creature avoided being carried with the digested matter, but sought to work against that course and keep always next to the lining of the intestine. Having found a suitable spot for its next maneuver the protozoan remained fixed for several minutes, although it was observed that the endoplasm was in a fine state of activity. The creature was seemingly growing smaller—then it was noticed

that in reality it was boring its way through the intestinal lining.

FOR a moment the movements of the protozoan were characterized by a seeming uncertainty. It moved slowly, deliberately from point to point within the intestinal sack of the mouse. Suddenly with a remarkable burst of energy it became a vicious pseudopodium clutching a blood vessel. Completely encircling the vein it worked industriously for several minutes digesting the material of the vessel itself. For a moment the body of the invading protozoan itself became a part of the tubing. Now with many twistings and turnings the consumed stuff of the vessel-walls was ejected by the protozoan, but in such a skillful manner, that this was used to weld the injured vessel together again. It was a slow, arduous process but the minute surgeon labored on relentlessly. His whole body was thinned and flattened to form a ring on the interior of the blood vessel. The invader was in his natural element at last. Its endoplasm was in an unusual flurry of activity. Moving easily and gently with the current of the blood, the protozoan fed prodigiously, swelled beyond its former proportions. The nucleus was undergoing a radical alteration. It became remarkably dark and assumed an oval shape. As this state continued the center of the oval became thinner, and endoplasm of the whole body became decentralized. The protozoan was reproducing itself by simple fission. The complete division came just before the heart was reached.

Minutes passed and then an hour and more. Round through the body coursed the "death protozoa." Each half of the first protozoan had upon maturing—which was but a few minutes after separation—begun the process of reproduction. As time went on the blood stream became everywhere polluted with the lit-

tle creatures. A chemical change was occurring rapidly in this world of animalism. The blood of the mouse was fast changing from its natural composition to a pulpy mass of parasites.

Von Sinka relaxed and looked to his guests. They, too were becoming wearied from the long strain of watching. A rest was suggested. Leaving the experiment intact they repaired to the dining-room of the Von Sinka mansion.

"We will leave for only a few minutes," Von Sinka reassured them, as he absently bit upon a little portion of a twig. "This adventuring into a new world is a serious strain."

Another hour found the group of interested investigators again assembled about the microscopic table. They once more adjusted the viewing screens with expectancy and eagerness. Von Sinka was working the controls. It was an easy task to pick up their journey at that point where they had left off, because the mouse, weakened by the excessive loss of blood, was lying down; its wildly beating heart the only indication of life in the wan creature.

"What manner of deathly disease have you discovered here, Von Sinka?" inquired the earnest Henderson.

"It is as novel as it is peculiar," was the reply. "I first came across the 'death protozoan' about five years ago while examining the heart of an individual who had died presumably from heart failure."

"But you cannot state that this is a "heart disease," at least not as is commonly found."

"No, indeed," Von Sinka resumed, "this is an unusual disease. The 'death protozoan' is probably a recent development in the evolution of the phylum Protozoa. Yet who knows with what rapidity it may spread throughout the world? There is but one preventative

that I know of at the present time."

"And what is that measure?" was the unanimous question.

"The answer is," Von Sinka replied with deliberate thoughtfulness, "in the complete destruction of the host by intense heat. Or in brief, one should say, by cremation."

CHAPTER IV

Into New Blood

RETURNING to the mouse it was found that in lieu of blood the substance flowing in the arteries and veins of the dying mammal was almost entirely a mass of the "death protozoa." They swallowed over and around one another in the last mad scramble for the few remaining drops of blood. It was noted that, as the blood supply was diminished to a point of actual scarcity, the productiveness of the protozoa was proportionately lessened. Despite the fact that the endoplasm was capable of digesting other forms of animal matter, blood alone would enable it to reproduce.

"Turn the beam again within the body of the mouse," urged Dr. Fretzmeier. "There is much yet to be learned in the study of such a dangerous disease."

"I am attempting to do it now," murmured Von Sinka in a strained voice. "For some unaccountable reason I am finding the task exceedingly difficult."

The receiving plates showed flares, shadows and quick successions of various scenes. Then it became steady, although completely out of focus. Von Sinka labored and with considerable effort finally succeeded in bringing the "eye" to a point of clearness. It showed a section of anatomy which was apparently a part of a live body. Slowly the "eye" was moved to a point within a nearby blood vessel. To the amazement of all

present there was blood there. How could this be when only a short while ago it had seemed that the protozoa had drained the mouse of the last of its vital fluid. However, before the matter could be discussed between them the men saw floating in the stream a single "death protozoan." It was undergoing simple fission and feasting lustily on the rich and abundant supply of blood. Von Sinka called the "eye" to follow the lone protozoan. Evidently by some queer chance this one, little vein had been overlooked by the invaders. On and on moved the protozoan, now two protozoan, and very soon four. Still the rich, flowing stream of blood came to no end. The minutes flew by and the "eye" burned steadily on one point. The protozoa were passing by in constantly increasing numbers now, and the blood stream was becoming perceptibly thinner.

Henderson, in the intensity of the excitement, without lifting his face from the screen begged Von Sinka to move the "eye" on. Surely there was more to this, the reason must be apparent.

Von Sinka did not reply.

Impatiently Henderson turned to him, to further discuss the extraordinary renaissance and re-death of the mouse. He gasped in awe. With quivering tones he called to Alfred and Dr. Fretzmeier. They, too, glanced at Von Sinka and gasped in horror.

* * * * *

ON Saturday morning the ashes of the famous scientist, Dr. Von Sinka, were placed in the private mausoleum of his estate. His malady was of a peculiar nature, it was commonly rumored, and equally as usual was the insistence of his fellow investigators that the body be cremated, which, they maintained, was in strict compliance with his dying request.

The Time Jumpers

By PHIL NOWLAN

We have already had several stories by this popular author in our magazines and here he brings us away from the prosaic present into other days and other epochs, and we can promise our readers a most enjoyable story in the present tale of jumping through time.

Illustrated by MOREY

OUR first experience with the time-car was harrowing.

It followed two experiments in which I had shot the contraption into the past and brought it back to the present again under automatic control. A very simple clockwork mechanism had served to throw the lever after I got out of the car, and then to reverse it again after ten minutes.

I had set the space-time co-ordinates for roughly 50,000 years, had hooked up the clockwork control, and stepping out, was about to close the door when Spot, a mongrel terrier, who used to make himself at home around the laboratory, frisked into the machine out of my reach and barked playful defiance at me.

In less than two seconds the car would start its maiden journey into the past. Spot wanted to play tag inside the car, and kept out of my reach. I didn't dare go in after him. I had no intention of risking my life in any time-travelling adventure until I had a better idea of what would happen.

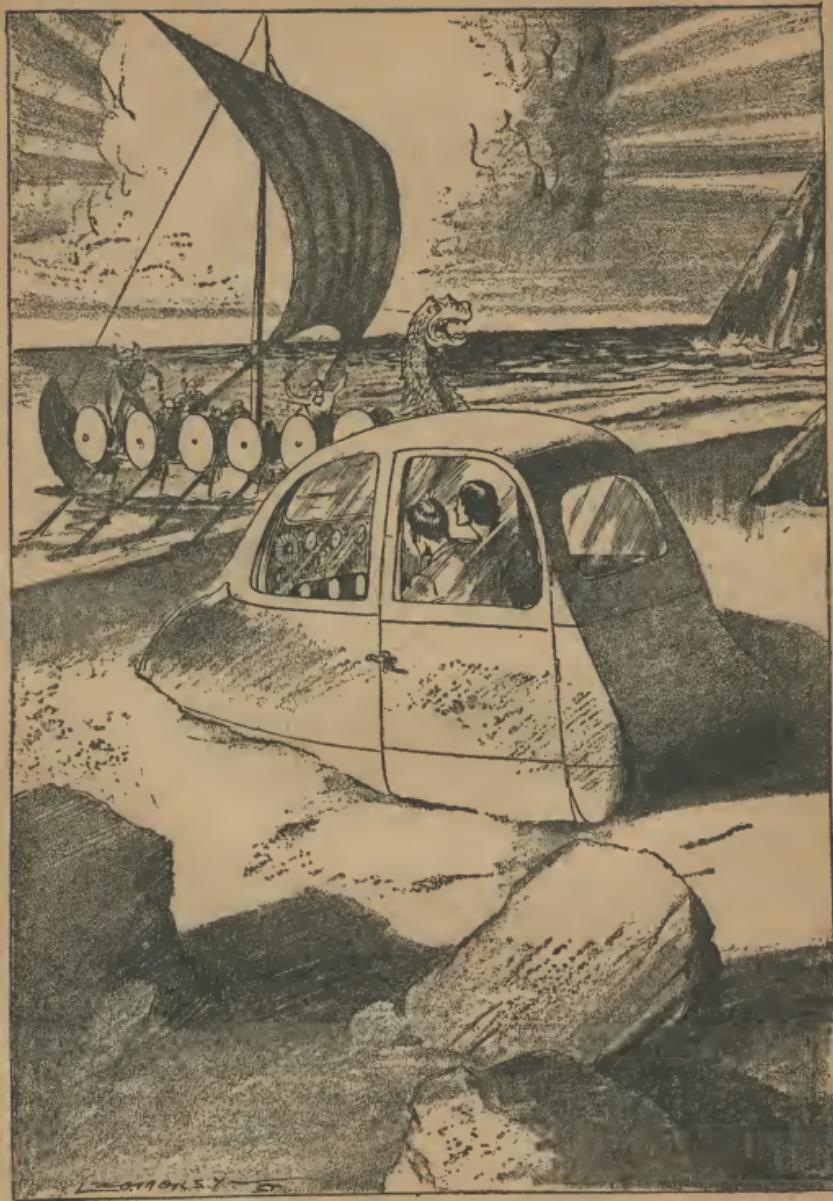
There was only one thing to do. I slammed the door and let Spot make the experiment.

Two backward leaps carried me to the opposite wall of the laboratory. From there I watched in breathless fascination.

Spot was up on his hind legs at one of the heavy quartzine windows. I could see rather than hear him barking. I could see too the blue glow that flashed up in one of the vacuum tubes inside the car. There came a low humming noise that grew in pitch and intensity, until I clapped my hands to my ears. Then I blinked, for the car was wavering and flickering, faster and faster as the hum faded into wave-lengths too short to affect my ear-drums. It took on an intangible ghostly appearance. I could see right through its shadowy form. Then it was gone.

IRUSHED to the spot where it had stood, waving my arms in front of me, and even ventured to stand where it had been. There was no doubt of it. It had gone.

I don't know how many minutes elapsed before I backed away from that spot again. I had been too excited to look at my watch. But when I realized how dangerous it would be to be standing there when the car returned—if it returned—I not only backed away, but scrambled for the great outdoors, taking a position some hundred feet away in the field to stare at the laboratory doors, while my heart pounded away the slow, breathless minutes. If my calculations had been correct the car should return



"Ted! Look! Look!" Cynthia grabbed my arm and pointed through the window toward the ocean. A strange-looking craft had run up on the beach even as we had been talking.

precisely to its former position. But they might not be exactly correct.

Nothing happened until I was conscious of the unpleasant feeling in my ears. Then the high whine became audible, and lowered in pitch until with a rumble it ceased, and I ran excitedly for the doors.

The car was there, not a foot out of position, but coated with black, dank mud nearly one-third of the way up. Spot was not at the window.

But Spot wasn't dead. I could hear his terrified yowls plainly even through the thick walls of the machine. When I threw open the door he slunk whimpering out, and not for several minutes did he recover sufficiently to begin jumping at my legs in an access of gratitude.

Maybe it was the operation of the machine; or maybe it was something he saw in the dim, distant past, into which I had hurled him so unceremoniously, that had terrified the dog. But at any rate, the important thing was that he had come through the experience safely. And, I figured, what a dog could do, I could do.

I left the co-ordinates as they were and sent the machine back again the next day, after I had rigged an automatic movie camera inside it. Again the time-car came back safely; but the film on development proved a disappointment. The exposure wasn't right, and it had registered only the faintest of impressions, of fern-like vegetation and great shadowy beasts. It was hopeless to even try to identify them.

IT was just a couple of days after this that Cynthia dropped in and nearly got us both into trouble. Cynthia is a kind of a cousin. At least I have always regarded her as such. She's the daughter of old Dr. Smith, inventor of the cosmic energy generator which is now so rapidly revolutionizing industry and transportation. He was also my guardian. I always called him uncle, and so Cynthia

has always seemed like a cousin to me.

She used to stop in at my laboratory every once in a while to see how my "crazy" idea of the time-car was developing. She knew all about it, of course, because her Dad had been good enough to supply me with one of his generators after I had used up all my modest fortune in buying up the total world supply of dobinium. There wasn't much of it, just a few ounces that had been extracted from a meteor that fell in Arizona. It was valuable only as a scientific curiosity, for no experimenters but myself had ever found a practical use for it. Yet when induced to activity through a bombardment of rays from the cosmic generator, its emanations formed the basis of the complex reactions of pure and corpuscular energy by which I was able to cut the curvature of space-time and hurl a material object backward along the time co-ordinates.

Of course I had explained it all to Cynthia many times, and I believe she did grasp the fundamental idea of the thing in a vague sort of way. She couldn't be her father's daughter, without having some sort of scientific head. But she had always been a bit skeptical about it.

"Why Ted Manley!" she gasped. "You don't stand there and expect me to believe that you actually sent this thing backward in time, and then brought it back—I mean forward—or whatever you call it, into the present, do you?"

"Ask Spot," I told her. "He made the trip in it." Spot jumped and cavorted around, trying to share her interest with a stick that he alternately dropped at her feet and pretended to run off with.

She tossed her head. "I don't believe it," then more seriously: "Why Ted! You—you know the whole idea is so—so unbelievable! There must be some other explanation." All the while she was gaz-

ing at the time-car with a curiosity she had never shown before.

"**M**AY I get in it?" she asked at last, and as was typical with her, she jumped in and sat on one of the leather-padded seats without waiting for my reply. I followed her in and closed the door.

"It is simple enough to operate," I said. "All you have to do is set the space-time co-ordinates so the beam of the indicator light falls on the year you want to visit. The motion of the earth through space since that time has been calculated and the machine set for it. I never would have been able to do it if they hadn't let me use the Calhoun Calculating Machine down in Washington." I waxed more enthusiastic. "But that isn't all! You see this adjustment here? By simply setting the latitude and longitude dials you can bring the machine to any part of the earth you want to——"

"And what's this lever for?" Cynthia interrupted me as she reached above her head. The lever moved half an inch under the pressure of her hand. And we were in for it!

A sudden droning hum, rising in pitch rapidly, made our teeth chatter and our ears hurt. Cynthia, her pretty little face a picture of horrified astonishment, shrieked as she glanced out one of the quartzine windows and saw the laboratory vanishing in a shimmering maze of vibrations.

"Now you've done it!" I groaned. "I don't know what the co-ordinates are set for, nor *when* or *where* we're going to land!"

Cynthia just had time to flash me a look of contrition, when again we felt the intangible pain of the vibrations, which lowered in pitch until they were audible and then rumbled to a quick stop. We turned frantically to the windows.

SAND dunes everywhere. No. Over to one side, where we could see between them, there was a glimpse of blue-green sea. The time-car was half buried in the sand, tilted at a slight angle. Otherwise everything seemed quite natural and we were in full possession of our faculties, having suffered no discomfort other than the terrible ringing in our ears and uncomfortable sense of vibration, which evidently had been due to the sound alone. Cynthia was still gasping for breath.

At length she gathered herself together and said: "Well, Ted, at least your machine goes *somewhere!* This looks like a deserted part of the Jersey coast to me."

"You'll find we've gone *somewhen* as well as *somewhere*," I replied, "but I haven't the least idea about——"

"Ted! Look! Look!" Cynthia grabbed my arm and pointed through the window toward the ocean.

A strange looking craft had run up on the beach even as we had been talking. It was a long, slender affair resplendent in brilliant colors, with a striped, square sail, and a row of shields along the rails. Long sweeps, glistening in the sun, were tossed inboard, and several armored figures leaped into the shallow water and waded ashore. They carried axes, and looked warily toward the dunes.

"Norsemen!" I muttered. "Now do you believe me, Cynthia?"

The girl gulped and nodded. "You win, Ted," she admitted. "It's—it's *magic!*—unbelievable! But, oh Ted, I'm kind of—frightened. Suppose something should—should *happen!*"

And as if enough hadn't happened already, one of the Norsemen spied our little time-car through the gap in the dunes. He pointed to us with his axe and spoke to another Norseman, evidently their leader. This one raised his arm, pointing first to the left and then to the right, and two compact parties of warriors trotted out of our line of vision,

heading toward the dunes as though to top them at some distance to either side of us. A third group, under the command of the leader, waited, gazing in our direction.

There was nothing for us to do but wait, or flash back to the Twentieth Century. We were partly buried in the sand and it was impossible to open the doors.

AFTER a bit the Norsemen on the beach must have received a signal from those who had disappeared, for the leader waved his arm to the right and left. Then, with the remaining group he marched grimly toward us through the soft sand.

They paused about fifty feet away and exchanged startled glances as they caught sight of our faces pressed to the quartzine windows. The chief waved his axe and shouted something. They all came running toward the time-car, spreading out to surround it. And I didn't like the look on their faces as they closed in.

"I—I think we b-better be g-going," Cynthia suggested. I thought so, too, and reached for the reverse lever. But to my consternation the handle moved too freely, and the shaft didn't turn at all. The little set-screw had loosened, and must have been barely hanging in place by the last thread, for when I fumbled at it with clumsy fingers, it dropped out. And to make matters worse, I snatched at it instinctively and only succeeded in batting it out of sight somewhere on the floor.

I heard Cynthia's little gasp of fear as I dropped on my knees to search for it. It was not to be seen. In a panic I jumped to my feet again, wondering if I could turn the shaft with my fingers.

The Norse warriors were not a bit frightened by what must have appeared to be a weird metal box. Nor was there the least sign of friendliness in the bearded faces that pressed against the windows, or the fierce, hostile eyes that

glared in at us with glances that roved curiously over the intricate set-up of coils, condensers, and the blue glow of the vacuum tubes.

Suddenly they withdrew a few paces, and an argument developed between the leader and another. They pointed toward us with their axes.

"Quick, Ted!" Cynthia whispered. "What's the matter? Throw the switch! Can't you see they're going to try to break in?"

It was true. The warrior who had been talking to the chief stepped up and took his position before one of the quartzine windows, planting his feet wide and swinging up his great axe for a mighty blow.

I gripped the starting shaft with my fingers until they hurt. I saw the Norseman's bearded lips curl back, and his muscles tense. I felt the shaft turn reluctantly.

Instantly the time-car hummed and vibrated. Slowly at first, it seemed, the axe swung downward. Then faster. The hum was a high whine.

Down came the axe in a powerful, slashing stroke as Cynthia and I shrank against the far side of the car. Straight through the side wall and quartzine window it clove, as though nothing were there to stop it. Amazement and panic flashed in the warrior's eyes. Then the shrill whine was descending to a hum that lowered quickly to silence. Through the windows of the time-car we saw the interior of my laboratory; and Spot, his tail between his legs, scrambling madly for the peaceful sunlight beyond the open doors of the building.

Cynthia was visibly trembling, and I know my own hand was none to steady as I helped her out of the car. She pushed me aside, weakly. With a sort of hollow feeling in the region of my stomach, and in a bit of a daze, I watched her as she walked a little uncertainly to the labor-

atory doors and inspecting herself in the tiny mirror of the Dorine, powdered her nose.

Then she turned and said: "We'll be better prepared for our *next* trip!"

CYNTHIA simply wouldn't hear of being left behind on the next trip. All my arguments as to the dangers involved fell on deaf little ears. I turned to propriety.

"But listen, Cyn," I protested. "Can't you see I can't let you do that? It would be highly unorthodox."

"Could anything be less orthodox than jumping into the past across time curves, or whatever you call them?" she countered. "Why strain the straw off the camel's back and then swallow the camel?"

"But you've got to remember that we're not really cousins," I insisted, "and it wouldn't be right to go off this—"

"Who's going to see us," Cynthia interrupted, "except a lot of people who have been dead for centuries maybe? Pooh for them! Don't be so completely ga-ga, Ted. We've known each other like a brother and sister all our lives, and if Dad could go off to Europe and trust me here during vacation, I don't see why—"

"All right. All right. We won't argue any more about it," I conceded. "Maybe we can make a short trip anyhow; start early in the morning and be back at night. What period do you think we should visit?"

Cynthia suggested Colonial days, or the American Revolution. "Think what a lot of hopelessly lost historical data we could gather, Ted," she said. We couldn't have gotten anything out of those Norsemen anyhow, even if they hadn't tried to smash us up. We couldn't have understood their language."

"No," I admitted. "But at least we established one thing. The Norse did get

as far down as the Jersey coast. Do you remember how fine that sand was? I don't think there are any beaches just like that, with such fine sand, much farther north than the South Jersey coast, are there? And by the way—we were so excited we never checked up on how far into the past we went."

We looked at the time-car's control dials. They registered 968-237. That meant 968 years ago, and 237 days; or, as a rapid calculation showed me, June 7, 993 A. D.

"Maybe it was Leif Ericsson himself we saw," Cynthia ventured.

"Maybe," I agreed, "but I don't want to be caught again by Leif or any of his friends; not cooped up in an iron box half buried in the sand that way. What we've got to do, Cyn, is to equip this car with a flock of rocket tubes, so we can shoot up in the air with it before we jump the time gap. Did you ever stop to think what might have happened if we had materialized in the year 993 *under* a pile of rocks or something? We can't always be sure what was at a given spot on the earth's surface at a given time. Maybe the ground level was way above what it is now, or way below. We might be buried—or drop a couple of hundred feet!"

"Any way you dope it, Ted, will be okay with me. Well, I'll be seeing you." And Cynthia hopped into her neat little sportster rocket plane and flashed away toward town.

It took me several days to make the necessary changes in the time-car. Fortunately I had counted on the possibility of making them from the beginning, and had designed the car so that the rocket tubes could be readily attached.

History contains many references to flaming "stars" in the sky. Of course the natural thing to assume is that the ancients had so recorded the observation of meteors. Even to-day people talk of

"shooting stars." But I chuckled as I wondered if any of these might have been—or *would* be—whichever way you choose to put it—my time car, riding down on its rocket blast, or shooting across the countryside.

Cynthia and I decided we'd try to land near New York about the year 1750. But the problem of costume bothered us. The things you can get from a theatrical costumer may pass pretty well behind the footlights in 1962, but we had a hunch they'd look pretty sad face to face with the people of 1750. In the end we compromised on a plan of representing ourselves as frontiersmen. That wasn't hard. Cynthia sewed fringe on our shirts and made fur caps with tails on them. She got herself a haircut like mine, and when we were all dressed up she might have passed for my younger brother. Both of us had spent plenty of time outdoors, so we were sufficiently tanned for the parts we determined to play. And for safety's sake we carried in concealed holsters a pair of neat little rocket guns that discharged tiny explosive rockets with no more noise than a slight hiss.

WE roared aloft on a powerful blast, and after a careful survey of the sky to see that there were no other craft near enough to take notice of our sudden disappearance in mid-air, we jumped the time-gap.

I thought I had set the co-ordinates for a spot on the Hudson, a few miles above New York. But either I made a mistake or there was some slight element of error in the mechanism, for we materialized over a wooded countryside that was not familiar to us. The forest, however, offered good concealment for the time-car, and we descended. It was something of a job to bring the 'bus down among the trees, but at last I maneuvered over a tiny clearing, and let her drop.

"Now that we're here," I said, "and

all ready for the adventure, I don't quite like the idea of leaving the time-car. It seems too much like cutting off our only possible method of returning to our own century."

"We might have to stay here, and get married and become our own ancestors," Cynthia giggled. Then more seriously: "You've got a lock on it, haven't you? Lock the door and come on."

"You know, Cyn, that's a puzzling aspect of this time-travelling you just brought up," I said as we headed into the woods away from the machine. "Seriously now, just suppose we did have to stay here in this period, and we did get married and have children, and our own descendants were—I mean will be—hobnobbing with us back—I mean forward—in 1963!"

Cynthia thought this one over. Then she said: "I have a feeling something would happen to prevent that, Ted. I don't pretend to understand all this relativity thing. And I don't know more than the A B C of the space-time continuum. But I just have a hunch that somehow that sort of thing couldn't happen. I don't know just how to explain it. It's as though we don't really belong in this century—as though we're not really *all* here, even though the ground is solid under foot, and the trees are very real, and so on.

"I don't know whether you noticed it or not," she went on, "but something very funny happened to us back there in 993. That Norseman's axe sliced right into the time car. The blade was way inside the field of the coils. But it didn't come back to the 20th Century with us in the car."

"Well that incident is easy to explain," I said. "I won't go into the mathematical theories involved, but I can give you a kind of a simile. It would be relatively as different a thing for the Norseman to go *forward* into the future as it would be

for us to *return* back into the past. And our time-car isn't designed to carry anything forward into the future. But even if it were, you see, it could only be done along the co-ordinate of the time-norm and the Norseman would be dead some ten centuries as we arrived back in the 20th Century. We'd have nothing with us but his skeleton, if we had even that. See? You can't go into the future except along the norm, and that means the full ageing process, even if you accomplish it in a relative instant. It's quite different from our *returning* to the future where we already——"

"You needn't bother to go any further," Cynthia cut in. "I'm dizzy. But I still have that hunch that though we *seem* normal and *feel* normal in this period, we're really not entirely real and —Oh what's the use of trying to put it in words? Anyhow, we're not going to be caught in this century and have to stay here."

BUT something happened at this instant that made it look as though Cynthia was wrong.

Something whizzed blindingly between our head and thudded into a tree behind us, where it stuck, quivering. It was an Indian arrow!

For one startled instant we stood as though paralyzed. Then Cynthia cried out: "Back to the time-car, Ted! Don't let them get there ahead of us!" And we were racing madly back through the forest to an accompaniment of blood-curdling yells that seemed to come from every direction.

Now more arrows were whirring past our ears, and the yells were closer. Cynthia tripped over a projecting root, and had I not caught her, would have fallen flat. As it was, we lost precious seconds.

Just why neither of us thought to use the rocket guns, we had so carefully provided ourselves with, I don't know. I

suppose it was because neither of us was accustomed to firearms and we didn't instinctively think of them. People act more by instinct than by reason in a crisis like this.

That neither of us was hit by the savages' arrows was due no doubt to the fact that the forest grew very thickly here, and it was difficult for them to get a clean sight on us as we ducked, dodged, jumped and slip on among the trees in our desperate flight.

We were back now, I thought, where the time-car should have been. But we must have veered off our path, for I could catch no glimpse of it among the trees ahead. There seemed to be no escape for us. The Indians were closer than ever, and flashing occasional glances over my shoulder, I glimpsed bronzed figures following, and felt that their purpose was not so much to overtake us as surround us.

Then suddenly the horrifying war whoops were stilled. And glancing back, I saw no bronzed bodies among the trees.

"Wh-what's the ma-matter?" Cynthia panted as she ran. "Aren't th-they ch-chasing us any m-more?"

"I I do-don't thuh-think so," I replied. "But we—better—k-keep running!"

We continued our desperate flight a bit farther, but when there was no sign of pursuit we slowed down to a hurried walk, panting and gasping too hard to talk right away.

"I DON'T think we came nearly this far, from the time-ship," Cynthia said at last. "If we've lost it, Ted, we are in a tough spot!"

"Well, I'm afraid we have," I had to admit. "But I'm even more uneasy about those Indians. We must have looked like easy pickings to them. I wonder why they quit so suddenly?"

I had lagged a few paces to look back. When I turned to follow Cynthia I ran

square into her. She was backing toward me, her arms outstretched to warn me, her gaze centered on a spot in the forest ahead where an indefinable patch of bright blue showed.

"Do you see it?" she whispered. "It's cloth I think. And I'm sure I saw it move!"

A voice, all the more startling because of its low, tense tone, made us snap our eyes suddenly to the left. "Stand where ye are!" it commanded, "and reach for no wepons!"

Only half concealed behind a tree a blue-coated figure stood, levelling a long rifle at us. Two or three others were moving softly out from their concealment toward us. I heard a faint sound to the right. There were more of them. We were surrounded.

"Reach for the sky, Cyn!" I said under my breath. "We're in a trap!"

Except that they were all badly in need of shaves, and their hair, which was arranged in little pigtails, looked kind of gummy, they didn't seem like a bad lot. Some wore buckskin leggings with their military coats, and others wore coonskin caps, and some had fringed hunting shirts. But there was an air of alertness and straightforwardness about them that relieved my mind considerably.

"Colonial troops!" Cynthia whispered.

"I hope so!" I replied.

Their leader stood before us now. "No rifles, hey?" he said. "Where did ye come from? Ye're not French!"

"**H**ARDLY," I replied. "We—we got lost. And Indians chased us."

"They'd be Algonkin devils," he commented. "Allies o' the French. They'd had yer skelps before now if—but here! We got no time to waste. Hi there! Robinson! Altrock! Take these two pris'ners back to the Colonel, will ye! And mind ye salute him precise. What with

these red-coated macaronis tramping all through the forest, the Colonel's startin' to set a heap o' store by cer-ee-monial!" And with that he was gone. His men, too, with the exception of the two into whose keeping he had given us, had faded silently into the forest.

And now a vague sound, of thousands of men tramping and crashing on through the forest in the distance, came to us from the other direction.

"Where are you taking us?" I asked one of the lads, for both were but youngsters.

"To th' Colonel," he replied curtly as they started us off down a trail in the direction of the crashing sound. And after a bit he made us draw aside while a long column of grenadiers in brilliant scarlet and white uniforms, marched by.

"British Redcoats!" Cynthia exclaimed.

"Aye" the boy muttered bitterly. "The rascallions! One of these days the Colonies'll get tired o' their high-handed ways an—." A bit startled at his own temerity he let his remark trail off into incoherence.

Our two guards weren't so communicative. Besides, Cynthia and I were getting an eyeful of the Britishers. They weren't nearly so impressive, we found, as the pictures of them in the history books. The queues and powdered hair didn't stand close inspection, and the mixture of sweat and powder didn't improve the appearance of the rather ill-fitting scarlet coats. The officers, of course, had better fitting uniforms and were much snappier in appearance. But all of them were pretty sorry looking from the knees down. The column evidently had forded a creek and splashed mud all over itself. And the high grenadier-hats frequently were knocked off by overhanging boughs, causing considerable confusion and evoking blistering comments from sergeants. Altogether it gave me quite a chuckle, and I

saw the corners of Cynthia's mouth twitching.

Immediately after the grenadiers came a party of mounted officers. Most of these wore the scarlet of the British regulars, but there was one conspicuous in buff and blue, whose keen glance instantly spotted the two Colonials and ourselves. He leaned forward to say something to the rather pompous Redcoats ahead of him, who could have been nothing less than a general, and saluting, pulled out of position and rode over to where we waited, well off the trail.

"Robinson and Altrock, isn't it?" he inquired as the two lads executed smart salutes. "And whom have we here? Prisoners?"

"Aye, sir! The Cap'n sent us back wi' them, sir."

NOW I had been gazing at this big, deep-voiced officer, with a disconcerting feeling that I had met him before, which of course was obviously ridiculous, since I had spent all of my life, but the past hour or so, in quite another century. And I noticed too that Cynthia was looking at him with astonishment.

"General Washington!" she burst out at last. "The Father of His Country!"

He turned on her sharply: "What's this—what's this?" he demanded. "You know me? But what is this nonsense of 'General,' and 'Father of My Country?' I am Colonel George Washington, of General Braddock's staff. But I don't understand the rest of your remark!"

Cynthia drew back in confusion as I whispered to her: "Sh! He isn't a general yet, and the Revolution has not been fought yet, Cyn!"

Washington heard some of this, I thought; and I fancied I saw a startled gleam in his eyes for just a moment. But if so, he had a good poker face. Even as I looked, his face was grave and calm.

The two Colonials told him how they

had picked us up in the forest, and mentioned the force of Algonkins that had chased us. He seemed concerned at this.

"We're halting a few rods up the trail," Washington said. "Bring your prisoners up there. General Braddock may want to question you, young men." His second remark was addressed to us. Evidently he had not penetrated Cynthia's disguise. He swung his horse about and galloped away.

Cynthia nudged me. "Why didn't you tell him?" she demanded.

"Tell him what?" I asked, still somewhat in a daze from the novelty of meeting a great historical character face to face, in the flesh.

"Why, about the *ambush*, stupid!"

"Oh," I said. "I forgot about that. But I will tell him."

It was about twenty minutes later that we approached Washington for the second time. He stood alone with General Braddock. The other officers had withdrawn. Braddock's manner was a bit impatient with Washington, though in a friendly sort of way.

"How now, Washington?" he was saying. "What can these ragged Colonials of yours, and these two babes o' the woods, tell us that we don't already know?" Washington winced and frowned slightly at the reference to "ragged Colonials," but he said:

"**I**f it please you, sir, they have to report a large force of French Indians ahead of us. The point is they must have known of our near approach or they would not have been in such great force, nor withdrawn so quietly and readily."

"Gad's 'Ounds, sir!" Braddock said testily. "But we already know Indians and French are ahead of us. And they must needs learn of our advance before we reach 'em! What of it all?"

"Just this sir!" I stepped forward and

saluted. "It is the intention of the French to ambush you, and——"

"What!" Braddock roared. "Ambush British Regulars! Let them try it! We'll sweep straight through their ambush with cold steel!" He turned angrily away, and addressing Washington, said:

"Come. I'm sick of this assumption that any naked rabble of savages the French can gather together with bribes of beads and trinkets can halt the advance of regular troops. You hear me, Washington? We're going straight through to Duquesne* Let me hear no more of any talk to the contrary." And he strode off, the very picture of stiff, military indignation.

Washington gave us a quick glance and raised his eyebrows significantly. He nodded his head slightly toward the forest.

"He means for us to scram," said Cynthia.

"How about it?" I asked the two Colonials. "Do we go free?"

"I reckon ye do," said one of the lads slowly. "Our orders was to bring ye to the Colonel. We ha' done that. There's no more orders, so belike we'd better be returning to our command." They headed into the trees and soon were lost to sight.

WE withdrew sufficiently far to be inconspicuous, and sat down to rest.

"You see how it is, Ted," Cynthia said thoughtfully. "Here we are with absolute pre-knowledge of what is going to happen—about Braddock's defeat, I mean—we warn him in plain words. But does it do a particle of good? No. He just gets mad and walks away. Washington knows the danger, but there's nothing even *he* can do about it. As for us—it's just as I said. We simply don't belong in this period. I don't believe anything we could do could possibly change

the course of history the slightest bit from what it is to be, because, you see, it already was—at least to *us*!"

"I guess you're right, Cyn," I said. "But you've got to admit that this is a lot of fun. Look at that old sergeant over there. How funny he looks in that badly fitting red coat, and the green grass stains on the seat of his pants. Yet I bet he's a real hard boiled egg in his outfit. None of them seem to see anything funny about themselves, or dream that they look to us like a bunch of comic-opera soldiers."

"No," said Cynthia, "and the tragedy of it all is that before they know it they're going to get bowled right over, just like a bunch of comic-opera soldiers—all except the blood and the slaughter—and—and there isn't a single thing we can do to prevent it." She sighed. "Well, Ted, we ought to try to locate the time-car before the slaughter starts. There's no reason why *we* should get dragged into it. It's not *our* fight."

I agreed with her. But before we set out we paused to look at a command of Iroquois Indians trailing silently, grimly past, on toward the head of the column. Then a bugle blew, sergeants shouted commands, and the column of Redcoats formed quickly and marched off up the trail.

AS nearly as we could figure it, our time car must be some distance ahead and off to the right of the trail somewhat farther on. And we followed intending to strike off among the trees somewhat farther on. And we followed slowly, because we wanted to be alone when we came to the machine. There was no use in having an audience to witness our return to the 20th Century.

But we were not destined to accomplish our purpose as easily as that. A crashing volley of musketry was borne back to us on the wind. Wild yells in the dis-

* Now Pittsburgh.

tance. More musketry fire, a bit more ragged this time. The sounds were coming nearer. Blood-curdling war cries of the Indians. The screams of terrified and tortured men. Musketry fire swelling into an almost continuous roll, and coming nearer.

"The slaughter will center chiefly on the trail!" I told Cynthia. "Let's beat it, quick! Straight to the right, away from the trail! And don't forget we've got rocket guns. We'll use them if we have to!"

Away we went through the trees, keeping a sharp lookout to the left, in the direction of the French. The firing was more behind us now, and was resuming something of its volley character.

"That's George Washington's work!" Cynthia panted, as we ran. "You know he was responsible for rallying the troops and preventing worse slaughter."

But as though to belie her words a wave of Redcoats, in mad panic swept down on us from our left. Some were cursing. Some laughing hysterically as they tripped and ran. They hurled their muskets and cross belts away, tossed aside their headgear. Some staggered and fell. One held up a bloody hand transfixed by an arrow shrieking insanely: "The Red Hand of O'Neil!—See the Red Hand of O'Neil!"

There was no sense in what they did. There couldn't have been a large force of pursuers. But these proud regulars, the pride of the British army, had simply cracked under the strain of battle conditions to which they were not accustomed. For the moment they were not disciplined troops, but fear-crazed animals, running in horror from some deadly terror they could not see.

I dragged Cynthia behind a great tree which, flanked by a couple of smaller ones quite close to it, formed a natural shelter, and held her, trembling in sheer

horror, while the wave of panic-stricken troops surged by.

As a matter of fact there were no pursuers. Not at the moment, at least. We ran from one to another of the fallen Britishers. They were all dead except one; and he died in our arms as we tried to relieve his suffering with water from his canteen.

"Well, Cyn, I guess it's no use hanging around here," I said as we stood up. "We know already how complete this victory is going to be. If we don't find that time-car pretty quick, we're not going to get back to the 20th Century at all."

"Oh, how horrible and bloody it all is," Cynthia said. Her voice trembled. "The way we read it in our school histories, it didn't seem like this at all, did it? Just to think! This poor fellow probably has a mother and father waiting for him on some peaceful English countryside, looking forward to the day when he comes home from the wars and——"

"Come, Cyn," I said, taking her elbow and steering her gently on through the forest. "It's all very sad and terrible. But there's nothing we can do about it. And we have to get back to that time-car!"

Several times we heard distant shrieks and cries; and two or three times musket shots. Once a party of Iroquois, allies of the English, crossed our trail ahead of us. We could see them slinking through the trees, glancing back occasionally in the direction of the French lines.

"That means the French or the Algonkins can't be far away," Cynthia said. "What do you think we better do?"

"I don't know. If we only knew exactly where the time-car is," I told her, "I'd take a chance and try to crash straight through to it. These are the days of solid shot, you know. Not even explosive artillery projectiles have been

invented yet. So unless we met an overwhelming opposition we ought to be able to scare off Indians with the explosive bullets of our automatics."

In the end I decided to climb a tree and see if we could get our bearings that way. I selected the tallest I could find, and finally made my way to the top, though I am quite sure that, had there been any Algonkins in the immediate neighborhood, they would have been attracted by the commotion I made.

All I could see in every direction was forest. No—was I mistaken? Did I see a flash, as though of the distant reflection of sunlight on glass, way over there? I couldn't be sure, but we had no better guide. So carefully noting the direction, I descended, and we set forth cautiously in that direction, pausing every few moments to listen carefully.

"I THINK we've come about the right distance," I said at length. "Let's circle about carefully. Isn't that a clearing over there?"

"I don't know," Cynthia replied. "That outcropping of rocks is in the way. You can't see very well what is beyond."

We made our way to the little ridge, and as Cynthia anxiously watched me, I crawled to the top, and exposing myself as little as possible, looked over.

There was the time-car, just as we had left it. I could see it through the trees about two hundred yards away. And gathered around it, touching and thumping it in obvious amazement, were some two dozen Indians. Even at this distance I could tell from their headdress that they were not the friendly Iroquois, but Algonkins.

Cynthia crawled up beside me and together we watched, hoping the Indians would pass on in their pursuit of the British column. But they didn't. Instead, when they had gotten through thumping and scratching at the locked

car, they proceeded to squat and stretch themselves on the ground as though waiting for something, or someone.

"Do you suppose they can damage it?" Cynthia whispered.

"I hardly think so," I replied. "Not with tomahawks, knives and arrows. None of them seem to have guns. A bullet might crack one of the quartzine windows, but I don't think it would break it. They're pretty thick, you know. The only trouble is there's no telling what a bunch of fool Indians will do. Suppose they took it into their heads to build a great bonfire around it?"

Then suddenly the savages were on their feet. The white uniform of a French officer had appeared among them. They gathered around him, gesticulating and pointing at our time-car. He stood with folded arms, ignoring the machine with a great air of dignity.

At length he held up his hand with a dramatic gesture and said something. The Indians backed away and subsided. Then he turned and gravely inspected the car, giving no sign, that we could see, of surprise.

"He naturally wouldn't," Cynthia murmured. "That's one reason the French were so successful with the Indians. They knew how to put on an act with them. Look, Ted! he acts as though a time-car were an every-day affair with him! Maybe he'll order them to go away and leave it."

"Not *he*!" I said. "He's caught sight of the coils and gadgets inside. He'll try to devise some way of breaking into it."

I WAS right. The Frenchman slowly drew his pistol from his belt and examined the priming. He was going to try to shoot the lock. Not that he could have broken in that way. But he might have ruined it and prevented our ever getting it open. The time for action had come. I raised my gun and took careful aim at the

ground some thirty feet this side of him.

I squeezed the trigger gently. The slight hiss from the muzzle was lost in the detonation of the tiny rocket-bullet where it hit the ground.

For a split second the Algonkins remained as though paralyzed, each in the position he had been in at the instant. Then, as though full of coiled springs, they leaped madly in every direction away from the spot where the explosion had occurred. The Frenchman had whirled and faced us, or rather the point of the explosion.

"Come, on, Cyn!" I cried. "We'll have to wade right into 'em!"

"Shoot at the ground in front of them!" she suggested.

We went over the top of the rock, shooting slowly and deliberately as we went, virtually laying a barrage down in front of us.

The officer shrank back from the terrific explosions and raised his futile pistol. But his shot went far wide of the mark as he staggered back, blinded from the approaching explosions, and threw his arm up before his eyes.

That lad had courage, though. The detonating bullets, which were somewhat more powerful than the old-fashioned handgrenades of 1917, were something entirely beyond any war experience he could ever have had back in the 1750's. But he didn't turn and run. He just backed slowly away among the trees, calling back to his Indians to turn and face the music. I could have blown him to bits any time I wanted to, but I didn't have the heart. As Americans this might have been our war. But we weren't Americans of that period, and somehow I didn't feel justified in doing a thing more than was necessary to win our way back to our own century.

STEADILY we approached the time-machine. The Frenchman was some

three hundred yards away now, taking advantage of the shelter of the trees. We only caught occasional glimpses of him. The Indians were completely gone, probably a half mile away by now.

Finally my gun just clicked. The magazine was empty. "Have you any shots left?" I called to Cynthia.

She nodded. "A few," she said.

"Then give him a final barrage," I said. "I'll open up the car."

I leaped to the door of the time-vehicle and inserted the key. With a sigh of relief I opened the door and turned toward Cynthia. Her magazine was empty too, and she was running toward me. A bullet clanged against the metal panel beside me. Frenchy was still in the game, and coming back at us. He had sensed that we had run out of ammunition, and was coming on the run with no attempt at concealment.

In we jumped, and I slammed and locked the door while Cynthia threw the power switch. Would those tubes never develop their blue glow? The officer was plunging toward us at full speed, sword in hand. He had thrown away his useless pistol.

Cynthia's hand trembled on the rocket-blast lever. I glanced alternately at the running Frenchman and the vacuum tubes. There was a faint glow in them now.

"Don't throw it yet!" I cautioned her. "Not till the tubes develop full glow. There's nothing he can do to us with that sticker of his, but if he gets too close the rocket blast will burn him to a cinder!"

He was still thirty feet away when Cynthia finally pushed the lever over. A blast of flame mushroomed out from under the car as we rose on it. The Frenchman halted short, staggered back and threw his arm up to protect his eyes. Then we were roaring aloft, with him standing there gazing up after us in amazement.

"I WONDER if this will go down in history?" Cynthia said. "I don't remember reading of anything like it, do you?"

"Not much," I chuckled. "Just let him try to tell a story like this when he gets to Fort Duquesne or to Quebec! Who'd believe him?"

I pulled the time-gap switch.

"Well," I said as we drifted down over my laboratory on reduced rocket blast, and in the good old 20th Century, "I like adventure, Cyn, but that was a little too hot for comfort."

"It was a little exciting," Cynthia replied, "but scarcely esthetic. Next time let's pick a more picturesque period of history."

THE END

What Do You Know?

READERS of AMAZING Stories have frequently commented upon the fact there is more actual knowledge to be gained through reading its pages than from many a text-book. Moreover, most of the stories are written in a popular vein, making it possible for anyone to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge of science.

1. What definition has been given of electricity science? (See page 8.)
2. Have you ever understood the meaning of the inscription on incandescent electric bulbs? (See page 8.)
3. What is the unit of energy based on the foot and the pound? (See page 8.)
4. What is the Bunsen disc? (See page 10.)
5. How does the carbon filament lamp compare in economy with the tungsten filament lamp? (See page 10.)
6. How much light will a horse power of electricity give with tungsten filament lamps? (See page 10.)
7. What is the unit expressing the action of light as far as the visual organs are concerned? (See page 10.)
8. What asteroid comes nearer to the earth than any other celestial body except the moon? (See page 25.)
9. What is the largest satellite of the Planet Jupiter? (See page 43.)
10. How does it compare with Mercury and Mars in size? (See page 43.)
11. What is to be said of the distance of Venus and of Mars from the earth? (See page 44.)
12. How long is the year on Mars? (See page 53.)
13. How does the microscopic hydra catch his prey? (See page 104.)
14. How may the passage of an amoeba through the food ducts of an animal be pictured? (See page 105.)
15. How is the productivity of protogaea affected by their diet—whether blood or other animal matter? (See page 107.)
16. What is the present name of the Colonial Fort Duquesne? (See page 118.)

A Descent Into the Maelstrom

[1841]

By EDGAR ALLAN POE

The ways of God in Nature, as in Providence, are not as *our* ways; nor are the models that we frame any way commensurate to the vastness, profundity, and unsearchableness of His works, which have a depth in them greater than the well of Democritus.

—JOSEPH GLANVILLE.

WE had now reached the summit of the loftiest crag. For some minutes the old man seemed too much exhausted to speak.

"Not long ago," said he at length, "and I could have guided you on this route as well as the youngest of my sons; but, about three years past, there happened to me an event such as never happened before to mortal man—or at least such as no man ever survived to tell of—and the six hours of deadly terror which I then endured have broken me up body and soul. You suppose me a *very* old man—but I am not. It took less than a single day to change these hairs from a jetty black to white, to weaken my limbs, and to unstring my nerves, so that I tremble at the least exertion, and am frightened at a shadow. Do you know, I can scarcely look over this little cliff without getting giddy?"

The "little cliff" upon whose edge he had so carelessly thrown himself down to rest that the weightier portion of his

body hung over it, while he was only kept from falling by the tenure of his elbow on its extreme and slippery edge—this "little cliff" arose, a sheer unobstructed precipice of black shining rock, some fifteen or sixteen hundred feet from the world of crags beneath us. Nothing would have tempted me to within half a dozen yards of its brink. In truth so deeply was I excited by the perilous position of my companion, that I fell at full length upon the ground, clung to the shrubs around me, and dared not even glance upwards at the sky—while I struggled in vain to divest myself of the idea that the very foundations of the mountain were in danger from the fury of the winds. It was long before I could reason myself into sufficient courage to sit up and look out into the distance.

"You must get over these fancies," said the guide, "for I have brought you here that you might have the best possible view of the scene of that event I mentioned—and to tell you the whole story with the spot just under your eye.

"We are now," he continued, in that particularizing manner which distinguished him—"we are now close upon the Norwegian coast—in the sixty-eighth degree of latitude—in the great province of Nordland—and in the dreary district of Lofoden. The mountain upon whose top we sit is Helseggen, the Cloudy. Now

raise yourself up a little higher—hold on to the grass if you feel giddy—so—and look out, beyond the belt of vapor beneath us, into the sea."

I looked dizzily, and beheld a wide expanse of ocean, whose waters wore so inky a hue as to bring at once to my mind the Nubian geographer's account of the *Mare Tenebrarum*. A panorama more deplorably desolate no human imagination can conceive. To the right and left, as far as the eye could reach, there lay outstretched, like ramparts of the world, lines of horridly black and beetling cliff, whose character of gloom was but more forcibly illustrated by the surf which reared up against its its white and ghastly crest, howling and shrieking forever. Just opposite the promontory upon whose apex we were placed, and at a distance of some five or six miles out at sea, there was visible a small, bleak-looking island; or, more properly, its position was discernible through the wilderness of surge in which it was enveloped. About two miles nearer the land, arose another of smaller size, hideously craggy and barren, and encompassed at various intervals by a cluster of dark rocks.

The appearance of the ocean, in the space between the more distant island and the shore, had something very unusual about it. Although, at the time, so strong a gale was blowing landward that a brig in the remote offing lay to under a double-reefedtrysail, and constantly plunged her whole hull out of sight, still there was here nothing like a regular swell, but only a short, quick, angry cross dashing of water in every direction—as well in the teeth of the wind as otherwise. Of foam there was little except in the immediate vicinity of the rocks.

"The island in the distance," resumed the old man, "is called by the Norwegians Vurrg. The one midway is called Moskoe. That a mile to the northward is Ambaaren. Yonder are Iflesen, Hoye-

holm, Kieldholm, Suarven, and Buckholm. Farther off—between Moskoe and Vurrg—are Otterholm, Flimen, Sandflesen, and Skarholm. These are the true names of the places—but why it has been thought necessary to name them at all, is more than either you or I can understand. Do you hear anything? Do you see any change in the water?"

We had now been about ten minutes upon the top of Helseggen, to which we had ascended from the interior of Lofoden, so that we had caught no glimpse of the sea until it had burst upon us from the summit. As the old man spoke, I became aware of a loud and gradually increasing sound, like the moaning of a vast herd of buffaloes upon an American prairie; and at the same time I perceived that what seamen term the *chopping* character of the ocean beneath us, was rapidly changing into a current which set to the eastward. Even while I gazed, this current acquired a monstrous velocity. Each moment added to its speed—to its headlong impetuosity. In five minutes the whole sea, as far as Vurrg, was lashed into ungovernable fury; but it was between Moskoe and the coast that the main uproar held its sway. Here the vast bed of the waters, seamed and scarred into a thousand conflicting channels, burst into frenzied convulsion—heaving, boiling, hissing—gyrating in gigantic and innumerable vortices, and all whirling and plunging on to the eastward with a rapidity which water never elsewhere assumes except in precipitous descents.

In a few minutes more, there came over the scene another radical alteration. The general surface grew somewhat more smooth, and the whirlpools, one by one, disappeared, while prodigious streaks of foam became apparent where none had been seen before. These streaks, at length, spreading out to a great distance, and entering into combination, took unto themselves the gyratory motion of the

subsided vortices, and seemed to form the germ of another more vast. Suddenly—very suddenly—this assumed a distinct and definite existence, in a circle of more than half a mile in diameter. The edge of the whirl was represented by a broad belt of gleaming spray; but no particle of this slipped into the mouth of the terrific funnel, whose interior, as far as the eye could fathom it, was a smooth, shining, and jet-black wall of water, inclined to the horizon at an angle of some forty-five degrees, speeding dizzy round and round with a swaying and sweltering motion, and sending forth to the winds an appalling voice, half shriek, half roar, such as not even the mighty cataract of Niagara ever lifts up in its agony to Heaven.

The mountain trembled to its very base, and the rock rocked. I threw myself upon my face, and clung to the scant herbage in an excess of nervous agitation.

"This," said I at length, to the old man—"this *can* be nothing else than the great whirlpool of the Maelström."

"So it is sometimes termed," said he. "We Norwegians call it the Moskoe-ström, from the island of Moskoe in the midway."

The ordinary accounts of this vortex had by no means prepared me for what I saw. That of Jonas Ramus, which is perhaps the most circumstantial of any, cannot impart the faintest conception either of the magnificence, or of the horror of the scene—or of the wild, bewildering sense of *the novel* which confounds the beholder. I am not sure from what point of view the writer in question surveyed it, nor at what time; but it could neither have been from the summit of Helseggen, nor during a storm. There are some passages of his description, nevertheless, which may be quoted for their details, although their effect is exceedingly feeble in conveying an imrpes-

sion of the spectacle.

"Between Lofoden and Moskoe," he says, "the depth of the water is between thirty-six and forty fathoms; but on the other side, toward Ver (Vurrgħ) this depth decreases so as not to afford a convenient passage for a vessel, without the risk of splitting on the rocks, which happens even in the calmest weather. When it is flood, the stream runs up the country between Lofoden and Moskoe with a boisterous rapidity; but the roar of its impetuous ebb to the sea is scarce equaled by the loudest and most dreadful cataracts; the noise being heard several leagues off, and the vortices or pits are of such an extent and depth, that if a ship comes within its attraction, it is inevitably absorbed and carried down to the bottom, and there beat to pieces against the rocks; and when the water relaxes, the fragments thereof are thrown up again. But these intervals of tranquillity are only at the turn of the ebb and flood, and in calm weather, and last but a quarter of an hour, its violence gradually returning. When the stream is most boisterous, and its fury heightened by a storm, it is dangerous to come within a Norway mile of it. Boats, yachts, and ships have been carried away by not guarding against it before they were within its reach. It likewise happens frequently, that whales come too near the stream, and are overpowered by its violence; and then it is impossible to describe their howlings and bellowings in their fruitless struggles to disengage themselves. A bear once, attempting to swim from Lofoden to Moskoe, was caught by the stream and borne down, while he roared terribly, so as to be heard on shore. Large stocks of firs and pine trees, after being absorbed by the current, rise again broken and torn to such a degree as if bristles grew upon them. This plainly shows the bottom to consist of craggy rocks, among which they are

whirled to and fro. This stream is regulated by the flux and reflux of the sea—it being constantly high and low water every six hours. In the year 1645, early in the morning of Sexagesima Sunday, it raged with such noise and impetuosity that the very stones of the houses on the coast fell to the ground."

In regard to the depth of water, I could not see how this could have been ascertained at all in the immediate vicinity of the vortex. The "forty fathoms" must have reference only to portions of the channel close upon the shore either of Moskoe or Lofoden. The depth in the centre of the Moskoe-ström must be immeasurably greater; and no better proof of this fact is necessary than can be obtained from even the sidelong glance into the abyss of the whirl which may be had from the highest crag of Helseggen. Looking down from this pinnacle upon the howling Phlegethon below, I could not help smiling at the simplicity with which the honest Jonas Ramus records, as a matter difficult of belief, the anecdotes of the whales and the bears; for it appeared to me, in fact, a self-evident thing, that the largest ships of the line in existence, coming within the influence of that deadly attraction, could resist it as little as a feather the hurricane, and must disappear bodily and at once.

The attempts to account for the phenomenon—some of which, I remember, seemed to me sufficiently plausible in perusal—now wore a very different and unsatisfactory aspect. The idea generally received is that this, as well as three smaller vortices among the Feroe islands, have no other cause than the collision of waves rising and falling, at flux and reflux, against a ridge of rocks and shelves, which confines the water so that it precipitates itself like a cataract; and thus the higher the flood rises, the deeper must the fall be, and the natural result of all is a whirlpool or vortex, the prodigious

suction of which is sufficiently known by lesser experiments."—These are the words of the *Encyclopædia Britannica*. Kircher and others imagine that in the centre of the channel of the Maelström is an abyss penetrating the globe, and issuing in some very remote part—the Gulf of Bothnia being somewhat decidedly named in one instance. This opinion, idle in itself, was the one to which, as I gazed, my imagination most readily assented; and, mentioning it to the guide, I was rather surprised to hear him say that, although it was the view almost universally entertained of the subject by the Norwegians, it nevertheless was not his own. As to the former notion he confessed his inability to comprehend it; and here I agreed with him—for, however conclusive on paper, it becomes altogether unintelligible, and even absurd, amid the thunder of the abyss.

"You have had a good look at the whirl now," said the old man, "and if you will creep round this craig, so as to get in its lee, and deaden the roar of the water, I will tell you a story that will convince you I ought to know something of the Moskoe-ström."

I placed myself as desired, and he proceeded.

"Myself and my two brothers once owned a schooner-rigged smack of about seventy tons burthen, with which we were in the habit of fishing among the islands beyond Moskoe, nearly to Vurrgh. In all violent eddies at sea there is good fishing, at proper opportunities, if one has only the courage to attempt it; but among the whole of the Lofoden coastmen, we three were the only ones who made a regular business of going out to the islands, as I tell you. The usual grounds are a great way lower down to the southward. There fish can be got at all hours, without much risk, and therefore these places are preferred. The choice spots over here among the

rocks, however, not only yield the finest variety, but in far greater abundance; so that we often got in a single day, what the more timid of the craft could not scrape together in a week. In fact, we made it a matter of desperate speculation—the risk of life standing instead of labor, and courage answering for capital.

"We kept the smack in a cove about five miles higher up the coast than this; and it was our practice, in fine weather, to take advantage of the fifteen minutes' slack to push across the main channel of the Moskoe-ström, far above the pool, and then drop down upon anchorage somewhere near Otterholm, or Sandflesen, where the eddies are not so violent as elsewhere. Here we used to remain until nearly time for slack-water again, when we weighed and made for home. We never set out upon this expedition without a steady side wind for going and coming—one that we felt sure would not fail us before our return—and we seldom made a miscalculation upon this point. Twice, during six years, we were forced to stay all night at anchor on account of a dead calm, which is a rare thing indeed just about here; and once we had to remain on the grounds nearly a week, starving to death, owing to a gale which blew up shortly after our arrival, and made the channel too boisterous to be thought of. Upon this occasion we should have been driven out to sea in spite of everything (for the whirlpools threw up round and round so violently, that, at length, we fouled our anchor and dragged it), if it had not been that we drifted into one of the innumerable cross currents—here to-day and gone to-morrow—which drove us under the lee of Flimen, where, by good luck, we brought up.

"I could not tell you the twentieth part of the difficulties we encountered 'on the ground'—it is a bad spot to be in, even in good weather—but we made shift al-

ways to run the gauntlet of the Moskoe-ström itself without accident; although at times my heart has been in my mouth when we happened to be a minute or so behind or before the slack. The wind sometimes was not as strong as we thought it at starting, and then we made rather less way than we could wish, while the current rendered the smack unmanageable. My eldest brother had a son eighteen years old, and I had two stout boys of my own. These would have been of great assistance at such times, in using the sweeps, as well as afterward in fishing—but, somehow, although we ran the risk ourselves, we had not the heart to let the young ones get into the danger—for, after all said and done, it *was* a horrible danger, and that is the truth.

"It is now within a few days of three years since what I am going to tell you occurred. It was on the tenth of July, 18—, a day which the people of this part of the world will never forget—for it was one in which blew the most terrible hurricane that ever came out of the heavens. And yet all the morning, and indeed until late in the afternoon, there was a gentle and steady breeze from the southwest, while the sun shone brightly, so that the oldest seaman among us could not have foreseen what was to follow.

"The three of us—my two brothers and myself—had crossed over to the islands about two o'clock P. M., and soon nearly loaded the smack with fine fish, which, we all remarked, were more plenty that day than we had ever known them. It was just seven, *by my watch*, when we weighed and started for home, so as to make the worst of the Ström at slack water, which we knew would be at eight.

"We set out with a fresh wind on our starboard quarter, and for some time spanked along at a great rate, never dreaming of danger, for indeed we saw

not the slightest reason to apprehend it. All at once we were taken aback by a breeze from over Helseggen. This was most unusual—something that had never happened to us before—and I began to feel a little uneasy, without exactly knowing why. We put the boat on the wind, but could make no headway at all for the eddies, and I was upon the point of proposing to return to the anchorage when, looking astern, we saw the whole horizon covered with a singular copper-colored cloud that rose with the most amazing velocity.

"In the meantime the breeze that had headed us off fell away, and we were dead becalmed, drifting about in every direction. This state of things, however, did not last long enough to give us time to think about it. In less than a minute the storm was upon us—in less than two the sky was entirely overcast—and what with this and the driving spray, it became suddenly so dark that we could not see each other in the smack.

"Such a hurricane as then blew it is folly to attempt describing. The oldest seaman in Norway never experienced anything like it. We had let our sails go by the run before it cleverly took us; but, at the first puff, both our masts went by the board as if they had been sawed off—the mainmast taking with it my youngest brother, who had lashed himself to it for safety.

"Our boat was the lightest feather of a thing that ever sat upon water. It had a complete flush deck, with only a small hatch near the bow, and this hatch it had always been our custom to batte down when about to cross the Ström, by way of precaution against the chopping seas. But for this circumstance we should have foundered at once—for we lay entirely buried for some moments. How my elder brother escaped destruction I cannot say, for I never had an opportunity of ascertaining. For my

part, as soon as I had let the foresail run, I threw myself flat on deck, with my feet against the narrow gunwhale of the bow, and with my hands grasping a ring-bolt near the foot of the foremast. It was mere instinct that prompted me to do this—which was undoubtedly the very best thing I could have done—for I was too much flurried to think.

"For some moments we were completely deluged, as I say, and all this time I held my breath, and clung to the bolt. When I could stand it no longer I raised myself upon my knees, still keeping hold with my hands, and thus got my head clear. Presently our little boat gave herself a shake, and thus rid herself, in some measure, of the seas. I was now trying to get the better of the stupor that had come over me, and to collect my senses so as to see what was to be done, when I felt somebody grasp my arm. It was my elder brother, and my heart leaped for joy, for I had made sure that he was overboard—but the next moment all this joy was turned into horror—for he put his mouth close to my ear, and screamed out the word '*Moskoe-ström!*'

"No one ever will know what my feelings were at that moment. I shook from head to foot as if I had had the most violent fit of the ague. I knew what he meant by that one word well enough—I knew what he wished to make me understand. With the wind that now drove us on, we were bound for the whirl of the Ström, and nothing could save us!

"You perceive that in crossing the Ström *channel*, we always went a long way up above the whirl, even in the calmest weather, and then had to wait and watch carefully for the slack—but now we were driving right upon the pool itself, and in such a hurricane as this! 'To be sure,' I thought, 'we shall get there just about the slack—there is some little hope in that—but in the next moment I cursed myself for being so great

a fool as to dream of hope at all. I knew very well that we were doomed, had we been ten times a ninety-gun ship.

"By this time the first fury of the tempest had spent itself, or perhaps we did not feel it so much, as we scudded before it, but at all events the seas, which at first had been kept down by the wind, and lay flat and frothing, now got up into absolute mountains. A singular change, too, had come over the heavens. Around in every direction it was still as black as pitch, but nearly overhead there burst out, all at once, a circular rift of clear sky—as clear as I ever saw—and of a deep bright blue—and through it there blazed forth the full moon with a lustre that I never before knew her to wear. She lit up everything about us with the greatest distinctness—but, oh God, what a scene it was to light up!

"I now made one or two attempts to speak to my brother—but in some manner which I could not understand, the din had so increased that I could not make him hear a single word, although I screamed at the top of my voice in his ear. Presently he shook his head, looking as pale as death, and held up one of his fingers, as if to say '*listen!*'

"At first I could not make out what he meant—but soon a hideous thought flashed upon me. I dragged my watch from its fob. It was not going. I glanced at its face by the moonlight, and then burst into tears as I flung it far away into the ocean. *It had run down at seven o'clock! We were behind the time of the slack, and the whirl of the Ström was in full fury!*

"When a boat is well built, properly trimmed, and not deep laden, the waves in a strong gale, when she is going large, seem always to slip from beneath her—which appears very strange to a landsman—and this is what is called *riding*, in sea phrase.

"Well, so far as we had ridden the

swells very cleverly; but presently a gigantic sea happened to take us right under the counter, and bore us with it as it rose—up—up—as if into the sky. I would not have believed that any wave could rise so high. And then down we came with a sweep, a slide, and a plunge, that made me feel sick and dizzy, as if I was falling from some lofty mountain-top in a dream. But while we were up I had thrown a quick glance around—and that one glance was all sufficient. I saw our exact position in an instant. The Moskoe-ström whirlpool was about a quarter of a mile dead ahead—but no more like the every-day Moskoe-ström, than the whirl as you now see it, is like a mill-race. If I had not known where we were, and what we had to expect, I should not have recognized the place at all. As it was, I involuntarily closed my eyes in horror. The lids clenched themselves together as if in a spasm.

"It could not have been more than two minutes afterwards until we suddenly felt the waves subside, and were enveloped in foam. The boat made a sharp half turn to larboard, and then shot off in its new direction like a thunderbolt. As the same moment the roaring noise of the water was completely drowned in a kind of shrill shriek—such a sound as you might imagine given out by the water-pipes of many thousand steam-vessels, letting off their steam all together. We were now in the belt of surf that always surrounds the whirl; and I thought, of course, that another moment would plunge us into the abyss—down which we could only see indistinctly on account of the amazing velocity with which we were borne along. The boat did not seem to sink into the water at all, but to skim like an air-bubble upon the surface of the surge. Her starboard side was next the whirl, and on the larboard arose the world of ocean we had left. It stood like a huge writhing wall between us and

the horizon.

"It may appear strange, but now, when we were in the very jaws of the gulf, I felt more composed than when we were only approaching it. Having made up my mind to hope no more, I got rid of a great deal of that terror which unmanned me at first. I suppose it was despair that struck my nerves.

"It may look like boasting—but what I tell you is truth—I began to reflect how magnificent a thing it was to die in such a manner, and how foolish it was in me to think of so paltry a consideration as my own individual life, in view of so wonderful a manifestation of God's power. I do believe that I blushed with shame when this idea crossed my mind. After a little while I became possessed with the keenest curiosity about the whirl itself. I positively felt a *wish* to explore its depths, even at the sacrifice I was going to make; and my principal grief was that I should never be able to tell my old companions on shore about the mysteries I should see. These, no doubt, were singular fancies to occupy a man's mind in such extremity—and I have often thought since, that the revolutions of the boat around the pool might have rendered me a little light-headed.

"There was another circumstance which tended to restore my self-possession; and this was the cessation of the wind, which could not reach us in our present situation—for, as you saw yourself, the belt of surf is considerably lower than the general bed of the ocean, and this latter now towered above us, a high, black, mountainous ridge. If you have never been at sea in a heavy gale, you can form no idea of the confusion of mind occasioned by the wind and spray together. They blind, deafen and strangle you, and take away all power of action or reflection. But we were now, in a great measure, rid of these annoyances—just as death-condemned felons in

prison are allowed petty indulgences, forbidden them while their doom is yet uncertain.

"How often we made the circuit of the belt it is impossible to say. We careered round and round for perhaps an hour, flying rather than floating, getting gradually more and more into the middle of the surge, and then nearer and nearer to its horrible inner edge. All this time I had never let go of the ring-bolt. My brother was at the stern, holding on to a large empty water-cask which had been securely lashed under the coop of the counter, and was the only thing on deck that had not been swept overboard when the gale first took us. As we approached the brink of the pit he let go his hold upon this, and made for the ring, from which, in the agony of his terror, he endeavored to force my hands, as it was not large enough to afford us both a secure grasp. I never felt deeper grief than when I saw him attempt this act—although I knew he was a madman when he did it—a raving maniac through sheer fright. I did not care, however, to contest the point with him. I thought it could make no difference whether either of us held on at all; so I let him have the bolt, and went astern to the cask. This there was no great difficulty in doing; for the smack flew round steadily enough, and upon an even keel—only swaying to and fro, with the immense sweeps and swelters of the whirl. Scarcely had I secured myself in my new position, than we gave a wild lurch to starboard, and rushed headlong into the abyss. I muttered a hurried prayer to God, and thought all was over.

"As I felt the sickening sweep of the descent, I had instinctively tightened my hold upon the barrel, and closed my eyes. For some seconds I dared not open them—while I expected instant destruction, and wondered that I was not already in my death-struggles with the wa-

ter. But moment after moment elapsed. I still lived. The sense of falling had ceased; and the motion of the vessel seemed much as it had been before while in the belt of foam, with the exception that she now lay more along. I took courage and looked once again upon the scene.

"Never shall I forget the sensations of awe, horror, and admiration with which I gazed about me. The boat appeared to be hanging, as if by magic, midway down, upon the interior surface of a funnel vast in circumference, prodigious in depth, and whose perfectly smooth sides might have been mistaken for ebony, but for the bewildering rapidity with which they spun around, and for the gleaming and ghastly radiance they shot forth, as the rays of the full moon, in that circular rift amid the clouds which I have already described, streamed in a flood of golden glory along the black walls, and far away down into the inmost recesses of the abyss.

At first I was too much confused to observe anything accurately. The general burst of terrific grandeur was all that I beheld. When I recovered myself a little, however, my gaze fell instinctively downwards. In this direction I was able to obtain an unobstructed view, from the manner in which the smack hung on the inclined surface of the pool. She was quite upon an even keel—that is to say, her deck lay in a plane parallel with that of the water—but this latter sloped at an angle of more than forty-five degrees, so that we seemed to be lying upon our beam-ends. I could not help observing, nevertheless, that I had scarcely more difficulty in maintaining my hold and footing in this situation, than if we had been upon a dead level; and this, I suppose, was owing to the speed at which we revolved.

"The rays of the moon seemed to search the very bottom of the profound

gulf; but still I could make out nothing distinctly, on account of a thick mist in which everything there was enveloped, and over which there hung a magnificent rainbow, like that narrow and tottering bridge which Mussulmans say is the only pathway between Time and Eternity. This mist, or spray, was no doubt occasioned by the clashing of the great walls of the funnel, as they all met together at the bottom—but the yell that went up to the Heavens from out of that mist, I dare not attempt to describe.

"Our first slide into the abyss itself, from the belt of foam above, had carried us to a great distance down the slope; but our farther descent was by no means proportionate. Round and round we swept—not with any uniform movement—but in dizzying swings and jerks, that sent us sometimes only a few hundred feet sometimes nearly the complete circuit of the whirl. Our progress downward, at each revolution, was slow, but very perceptible.

"Looking about me upon the wide waste of liquid ebony on which we were thus borne, I perceived that our boat was not the only object in the embrace of the whirl. Both above and below us were visible fragments of vessels, large masses of building timber and trunks of trees, with many smaller articles, such as pieces of house furniture, broken boxes, barrels and staves. I have already described the unnatural curiosity which had taken the place of my original terrors. It appeared to grow upon me as I drew nearer and nearer to my dreadful doom. I now began to watch, with a strange interest, the numerous things that floated in our company. I *must* have been delirious—for I even sought *amusement* in speculating upon the relative velocities of their several descents toward the foam below. 'This fir tree,' I found myself at one time saying, 'will certainly be the next thing that takes the

awful plunge and disappears'—and then I was disappointed to find that the wreck of a Dutch merchant ship overtook it and went down before. At length, after making several guesses of this nature, and being deceived in all—this fact—the fact of my invariable miscalculation, set me upon a train of reflection that made my limbs again tremble, and my heart beat heavily once more.

"It was not a new terror that thus affected me, but the dawn of a more exciting *hope*. This hope arose partly from memory, and partly from present observation. I called to mind the great variety of buoyant matter that strewed the coast of Lofoden, having been absorbed and then thrown forth by the Moskoe-ström. By far the greater number of the articles were shattered in the most extraordinary way—so chafed and roughened as to have the appearance of being stuck full of splinters—but then I distinctly recollect that there were *some* of them which were not disfigured at all. Now I could not account for this difference except by supposing that the roughened fragments were the only ones which had been *completely absorbed*—that the others had entered the whirl at so late a period of the tide, or, from some reason, had descended so slowly after entering, that they did not reach the bottom before the turn of the flood came, or the ebb, as the case might be. I conceived it possible, in either instance, that they might thus be whirled up again to the level of the ocean, without undergoing the fate of those which had been drawn in more early or absorbed more rapidly. I made, also, three important observations. The first was, that as a general rule, the larger the bodies were, the more rapid their descent; the second, that, between two masses of equal extent, the one spherical, and the other of *any other shape*, the superiority in speed of descent was with the sphere; the third, that, be-

tween two masses of equal size, the one cylindrical, and the other of any other shape, the cylinder was absorbed the more slowly.

"Since my escape I have had several conversations on this subject with an old school-master of the district; and it was from him that I learned the use of the words 'cylinder' and 'sphere.' He explained to me—although I have forgotten the explanation—how what I observed was, in fact, the natural consequence of the forms of the floating fragments—and showed me how it happened that a cylinder, swimming in a vortex, offered more resistance to its suction, and was drawn in with greater difficulty than an equally bulky body, of any form whatever.*

"There was one startling circumstance which went a great way in enforcing these observations, and rendering me anxious to turn them to account, and this was that, at every revolution, we passed something like a barrel, or else the broken yard or the mast of a vessel, while many of these things, which had been on our level when I first opened my eyes upon the wonders of the whirlpool, were now high up above us, and seemed to have moved but little from their original station.

"I no longer hesitated what to do. I resolved to lash myself securely to the water cask upon which I now held, to cut it loose from the counter, and to throw myself with it into the water. I attracted my brother's attention by signs, pointed to the floating barrels that came near us, and did everything in my power to make him understand what I was about to do. I thought at length that he comprehended my design—but, whether this was the case or not, he shook his head despairingly, and refused to move from his station by the ring-bolt. It was impossible to force him;

* See Archimedes, *De Incidentibus in Fluido*, lib. 2.

the emergency admitted no delay; and so, with a bitter struggle, I resigned him to his fate, fastened myself to the cask by means of the lashings which secured it to the counter, and precipitated myself with it into the sea, without another moment's hesitation."

"The result was precisely what I had hoped it might be. As it is myself who now tell you this tale—as you see that I *did* escape—and as you are already in possession of the mode in which this escape was affected, and must therefore anticipate all that I have farther to say—I will bring my story quickly to conclusion. It might have been an hour, or thereabout, after my quitting the smack, when, having descended to a vast distance beneath me, it made three or four wild gyrations in rapid succession, and, bearing my beloved brother with it, plunged headlong, at once and forever, into the chaos of foam below. The barrel to which I was attached sunk very little farther than half the distance between the bottom of the gulf and the spot at which I leaped overboard, before a great change took place in the character of the whirlpool. The slope of the sides of the vast funnel became momentarily less and less steep. The gyrations of the whirl grew, gradually, less

and less violent. By degrees, the froth and the rainbow disappeared, and the bottom of the gulf seemed slowly to uprise. The sky was clear, the winds had gone down, and the full moon was setting radiantly in the west, when I found myself on the surface of the ocean, in full view of the shores of Lofoden, and above the spot where the pool of the Moskoe-ström *had been*. It was the hour of the slack—but the sea still heaved in mountainous waves from the effects of the hurricane. I was borne violently into the channel of the Ström, and in a few minutes, was hurried down the coast into the 'grounds' of the fishermen. A boat picked me up—exhausted from fatigue, and (now that the danger was removed) speechless from the memory of its horror. Those who drew me on board were my old mates and daily companions—but they knew me no more than they would have known a traveller from the spirit-land. My hair, which had been raven black the day before, was as white as you see it now. They say too that the whole expression of my countenance had changed. I told them my story—they did not believe it. I now tell it to *you*—and I can scarcely expect you to put more faith in it than did the merry fishermen of Lofoden."

THE END



In the Realm of Books

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This is the sixteenth Tarzan novel, and like the others will undoubtedly have appeal to all the countless devotees of this unique character.

Tarzan, under the able guidance of Mr. Burroughs, has covered an enormous amount of territory. He has even penetrated to the Interior of the Earth (see the *Pellucidar* series) and in this book we follow Tarzan into Abyssinia, a country more unknown than Thibet, a country which is said to hold the secret of the lost tribes of Israel.

Having barely entered this forbidding and forbidden country, he is sorely beset by a band of outlaws, whom he outwits. He locates their concealed camp, liberates a prisoner clad in an ivory armor, from whom he learns, after he has mastered the captive's language that he, the captive, comes from the city of Ivory, which can only be reached by going through the country of the Lion people, whose capital is the City of Gold.

Between these two cities exists an eternal feud, and the latent possibilities of adventures whet Tarzan's appetite. Valthor, his companion, has been separated from him during a tempest, but Tarzan being swept away by a flooded river, lands in Cathine, the City of Gold, where he is accused of having come to murder the queen and is imprisoned.

His dungeon is shared by Phobeg, a soldier as big as he is stupid, and since Tarzan refuses to pay homage to the Queen, both are condemned to gladiatorial combat in the arena, whence Tarzan emerges victorious, of course.

According to ancient rules, Tarzan is liberated and becomes friendly with several nobles. One of them has a sweetheart even more beautiful than the Queen, and through the usual court intrigues, the jealous queen, who will not tolerate any other beautiful woman, orders the girl thrown into an active volcano, which is quite handy near-by.

In the meantime the Queen has fallen violently in love with Tarzan, and, as he spurns her love, he is again imprisoned and next day the furious queen stages a hunt, with Tarzan as the quarry and a specially trained lion as the pursuer. Just as the lion is about to finish Tarzan, his old friend, the Golden Lion, "Jad-Bal-Ja", arrives, kills the hunting lion, the queen commits suicide.

Tarzan leaves for new adventures elsewhere.

These are some of the high lights in the new Tarzan book, all the minor adventures could not even be summarized, and it is quite definite that all "Tarzan" fans will find even more than the usual number of thrills.

"Tarzan and the City of Gold" is a very fine, entertaining fantastic yarn. We take this occasion to compliment the publisher upon the appearance of the book itself. It is well bound, very legibly printed and handsomely illustrated by J. Allen St. John.

—C. A. Brandt.

"The Shape of Things to Come," by H. G.

Wells. Published by the Macmillan Company, 60 Fifth Avenue, New York City, N. Y. 431 pages, \$2.50. A Potential Phantasy.

This, Mr. Wells' latest book, pretends to be a transcript of stenographic notes of dreams experienced by a Dr. Raven, and Mr. Wells claims that these dreams foretold the history of the world up to 1933. From then on Mr. Wells is on his own and he does some tall prophesying now and then. For instance he reports an interview with Benito Caruso in 1958, who seemed confident that "The Great Engineer's" (Hoover) slump would be over soon.

The book is a sort of continuation of his world history predicting future development as far as 2106. It is divided into five separate books of which book one dealing with the immediate result of the war of 1914-1918 and book two, called "The Age of Frustration" are quite readable. The other three are as dreary as any treatise on National Economy or a new mathematical theory. Book two, "The Age of Frustration" deals with things with which our readers are quite familiar: The downfall of a civilization, when there are no more trains, when humanity lives in concrete caves, gas wars and germ wars, etc., etc.—all pictures which have been drawn for us time and time again. The last three books are strictly political, with only here and there a dash of the old Wells of science fiction.

—C. A. Brandt.

NOTES ON MOVING PICTURES

F. P. 1

This department is at all times more than glad to give credit to anyone who brings about a much needed improvement in moving or

talking pictures and as it was to be expected, European producers, this time Britons, have stolen a march, not to say a marathon on the rapid travelling Hollywood "Fillumgentsia".

I am writing about the new film "F. P. 1" meaning "Floating Platform No. 1". The actual title in German is: "F. P. 1", written by Kurt Siodmak.

"F. P. 1" appeared as a marvelously illustrated serial in "Die Woche", starting October 23, 1930, then in book form and was shortly filmed in Germany. Why the German film, which I was told was quite good, was never shown here is beyond my understanding. Judging from what is shown in this country in foreign films, it seems that the importer of foreign films dare not import anything but standardized trash. Who is afraid of comparisons?

The slogan of scientific fiction is "Fiction today, Fact to-morrow" and I for one would like to live long enough to re-read "F. P. 1" thirty years from now. Considering the fact that aviation is barely twenty years young, was there anywhere a more stupendously marvelous development than that in aviation? Compare the Wright Bros. flying machine and the "Do. X", and how will the flying machines of thirty years hence look, if this development keeps up. The Ocean has been crossed quite often by planes, but all these flights were pioneer stunts more or less, and only with the establishment of just such floating platforms as we are shown in F. P. 1 will it be possible to safely establish scheduled transoceanic plane flights. The possibility of establishing such platforms is technically quite feasible, but as long as the nations are more interested in organized destruction and legalized murder known as war, and much less in creating something really worth while and useful, a floating island may remain a dream for many many years.

At any rate the producers of "F. P. I." are to be congratulated in having done their part in visualizing such a dream. The film follows the book fairly closely, at least in the technical parts, and the film runs more or less like this:

Captain Droste (Leslie Fenton) a naval designer tries to interest English capitalists in his floating island, but gets what is known as the cold shoulder. Major Ellissen (Conrad Veidt) an internationally famous flier stages a robbing as a publicity stunt, which works. German capital builds the floating platform and the others plan sabotage which is almost successful. The scoundrelly First officer (Warwick Ward) gets it pleasingly in the neck, after having almost sunk the F. P. I. by opening the seacocks and letting the fuel for the Diesel pumps run out.

He also shoots up the instrument board, the wireless and Captain Droste, who in the two years absence of Ellissen has fallen very much in love with the lovely Claire (Jill Esmond).

The shots are heard in Berlin over the wireless and as F. P. 1 does not answer, it is clear that something is very wrong. Ellissen who also was in love with Claire, but had to go on a try for a non-stop around the World flight, arrives just in time to take Claire to the slowly sinking "F. P. 1". Ellissen goes haywire when he finds out that Claire loves Droste, but his better nature asserts itself and he leaves the platform in a crippled plane, locates a ship, bails out in midocean and in response to the wireless we see an armada of planes including the DoX (very cleverly interpolated) going to the rescue carrying drums and drums of oil for the Diesels.

"F. P. 1" is saved and the lovers are happily united as it must be in the "Talkie Land."

Perhaps the picture would have been better if the plot had been worked out a little more carefully, but as we are chiefly concerned with the technical and science-fiction side of this film, I wish to go on record and say that that part is extremely well done. The photography is almost superb and the truly gigantic dimensions of the "F. P. 1" are quite plausibly presented. "F. P. 1" is first class entertainment, novel, exciting, and very much different from the usual standard trash. If the actual powers in Hollywood only knew what treasures are piled up in such stories as this Magazine has published, they would discontinue reeling off sickly sweet idiocies and gangster adulations.

—C. A. Brandt.

"TARZAN THE FEARLESS"

All of us liked the various "Tarzan" yarns, but when such a miserable concoction is presented I am compelled to rise up in rebellion.

The best actors, comedians, in the picture are the two chimpanzees, then from an athletic point of view comes Buster Crabbe, a perfect male and wonderfully agile. The plot of the story is "The Lost Tribe," who, living in the densest possible jungle, ride about on fast horses, worship a sort of Egyptian God, fitted out with the sacred symbol of Egypt, the Ankh.

The aforementioned "Lost Tribe," ruled by a sad-looking high priest, captures an ambitious explorer, whose pretty blond daughter (see "Trader Horn") is on the way to visit him, but is rescued by Tarzan, who lives just around the corner. Tarzan also rescues the girl, who went swimming in a crocodile-infested river, battles valiantly with a papier-mache crocodile, and—now what do you think—falls in love.

There is also a highly amusing tickling bout between Tarzan and a well-manicured lion, and a portable phonograph plays also an important rôle, and with the elevating strains of "Button up your overcoat for another piece of pie" the picture ends.

—C. A. BRANDT.



DISCUSSIONS

In this department we shall discuss every month topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

The Small Format of AMAZING STORIES Is Approved Of—A Very Friendly Letter
Editor, AMAZING STORIES:

I first made your magazine's acquaintance two years ago at a Woolworth store. Since then I have obtained every copy I could get, which did not amount to many. This year, though, they have been more frequent and I have only missed two issues.

I am now a subscriber through your London agency, my first subscription number being the July issue. In this issue I noted that you were asking readers' opinions on reprints of the Skylark of Space, and Skylark Three. I would like to cast my vote for a reprint of these stories, if I am not too late. The stories—well, I can only say there hasn't been a single poor or second-rate story in any of the three subscription issues I have obtained so far.

I was sorry to see that I would have to wait two months for the next issue of the mag., but the changes in the October issue made up partly for the wait. The small size is excellent, never change back again, and the stories—well! Indeed they are the cream of Science Fiction. By the way, I would like to see a fresh adventure of Professor Jameson and the Zoromes every month.

Has the Fall-Winter, 1933, Quarterly come out yet? There has been no announcement of its advent in the mag.

I hope and pray that A. S. may be with us for ever, for I like the new mag. Oh! Before I forget, thanks for not running a serial between the different sizes, as some magazines do when they change size. Yours, for as long as possible,

PHILIP S. HETHERINGTON,
"Tycooly,"
Southwaite,
Carlyle,
Cumb.,
England.

(Just at present, we have so many stories to dispose of that we are not able to promise an early reprint of the Skylark Series. The Quarterly you ask for is now out. Your approval of the reduction in the format of the magazine indicates that you agree with us. Personally we think the small size brings AMAZING STORIES into the line with some of the very best magazines published. There are more of Professor Jameson's troubles impending. You

will hear from him very soon again. We thank you for your letter as we greatly appreciate the opinions of readers of other countries.—EDITOR.)

An Oldtime Reader Gives His Views on the Criticisms of AMAZING STORIES
Editor, AMAZING STORIES:

'Way back in April, 1926, I was attracted by a vivid new magazine; I bought it, and have been buying it ever since.

I have no criticism to make about any of the stories, except to say that I've enjoyed every one of them since the first.

My advice to so-called critics is this: Do not say any story is bad, just because you do not like it; someone else may think it is very good.

Wouldn't it be "Amazing" if everyone liked the same things?

I have a number of early issues of AMAZING STORIES which I would be glad to sell to anyone desiring to round out his collection.

EUGENE KINGREY,
757 Parkview Avenue,
Dayton, Ohio.

(This writer has been very faithful to AMAZING STORIES and we can assure him that it is a most gratifying thing to get such letters as his. You certainly are very close to the mark when you say, "What will please one will not please another." You know the old proverb, "What is One Man's Meat is Another Man's Poison." We are glad to have some one on our side.—EDITOR.)

The November Issue of AMAZING STORIES—“The Price of Peace” Commented On
Editor, AMAZING STORIES:

The November issue is much better than the October. I liked Harl Vincent's story best. I hope that you have other stories on hand by this favorite author. "The Battery of Hate" by John W. Campbell, Jr., is very good. I hope that it's not long before we can read another of his tales.

The best of the short stories is "The Price of Peace" by Mortimer Weisinger. He picked on a good subject to write on and did it well. I am in hopes that our new author will appear in print again soon.

Morey's cover is better than he has done for some time, but I prefer brighter colors. Why do you use such cheap cover paper? A heavy

paper with a good, smooth finish should be used.

Why don't you tell us what to expect next month? The space at the end of one of the stories could be used.

By reducing the size of the title on the contents page, the Jules Verne picture could be returned.

JACK DARROW,
4224 N. Sawyer Ave.,
Chicago, Ill.

(We will take into consideration the putting in of names of stories for the next issue. This we used to do, but the reduction in the size of the page made it difficult for us to find a place for it. However, we will take it into full consideration and shall hope to carry out your suggestion which is a valuable one. The title page is so small that there is no room on it for the Jules Verne picture.—EDITOR.)

An Interesting Letter from a Hindu
Editor, AMAZING STORIES:

I have seen that some of the readers object to the weird stories that have appeared in AMAZING STORIES. They say those stories are not scientific. That is not true always.

I am a Hindu. My ancestors were of the priest class in India and I know all the tricks of the trade as you call them. Almost all Europeans who come to India and see such things as the tricks of the yogis, throwing a rope up into the air and having it stand straight up. Then a man climbs up the rope and vanishes. This is always done in an open field so that the upper end of the rope seems to be connected only to the air. And the man disappears into nothing and then he appears climbing down the rope. Europeans think this is done by some weird unknown art. But it is done only by a thorough knowledge of physics.

So these weird happenings in weird stories are likely to be explained by science. Not magic. I think we should have more of these stories.

I disagree with Milton Kaletsky who says this magazine is monotonous. It is monotonous in form only. But that is true of all your American magazines. The editorials and stories are always giving something new. So Mr. Kaletsky is wrong.

The story "The Price of Peace" had a clever idea but was poorly written. Besides the typographical errors there were two errors in science in that story.

Excuse please any mistakes I have made. I do not know this language well.

LUMAN ZARAN,
14 Albany Street,
Yonkers, N. Y.

(Your last sentence asking us to excuse any mistakes in your letter is quite unnecessary as you really write perfect English, but we do wish you would explain to us how Yogi tricks of the trade are performed. Can we not hope

to receive a letter from you, explaining these seeming miracles?—EDITOR.)

Going to the Moon Held to Be in the Future—
Two Stories Not Liked
Editor, AMAZING STORIES:

In your comment on a letter written by Alan F. Wiggin you said: "Personally, we do not believe that man will ever reach the moon." If that is your belief, it seems to me that you are encouraging a cause, and incidentally, making money by it, in which you have no faith, in other words—you are selling a product in which you have no faith. I believe that a great many of your readers as firmly believe in inter-planetary flight as a few men did in aeroplanes before the Wrights flew, even after a great scientist proved by mathematics that an aeroplane could not fly. I think that you owe it to your readers to justify your statement, and I am looking forward to what you have to say.

All stories in the November issue were good except "The Beetle in the Amber" and the reprint.

A. J. STINNETT,
104 N. Randolph St.,
Lexington, Va.

(The writer of this letter certainly does not hesitate to say what he means. It was considered a very great achievement when a balloon was taken up to eleven miles above the surface of the earth, marking the highest point man has ever reached, and that was a very small fraction of the distance to the moon. It is perfectly true that work is being done on rocket propulsion and that is the only method known to us of propelling an object through a vacuum by self-contained force. We admit that as regards going to the moon, we are in the same class that Professor Simon Newcombe occupied with regard to the heavier than air machines. There is a theory that the incredulity of practically everybody was an element that operated to produce the death of Professor Langely of the Smithsonian Institute who had done excellent work in the testing out of flying and soaring, and who was an eminent scientist, but could find no one to believe in his work on airplanes. The reprint in the November issue was one of Edgar Allan Poe's best efforts. Do not let the discouraging views of the world at large about going to the moon affect your health.—EDITOR.)

A Sympathetic Letter Referring to Criticisms
in Discussions

Editor AMAZING STORIES:

I think the November, 1933, issue of AMAZING STORIES is the best issue since April, 1926. The best story was "The Whisper of Death" by Harl Vincent. It is his masterpiece and he has written a number of good stories.

The Editorial by Doctor Sloane was fine, as

usual; it was very educational. His editorials have meant a great deal in my study of science. "The Battery of Hate" by John W. Campbell, Jr., was a good story and a close second to "The Whisper of Death." It deserves honorable mention in this complimentary epistle. It was gripping from start to finish.

The conclusion to "When the Universe Shrunk" by J. Lewis Burt was fine. He continues to be one of our best authors.

I would like to see another of David H. Keller's stories in our magazine soon. He is, in my opinion, your best author. I am glad that AMAZING STORIES continues to be that fine and honorable tradition of Science-Fiction. I cannot see why the readers of AMAZING STORIES find so much fault with the stories, cover, etc. I, myself am a contented reader. It certainly is a relief to me to know there is one clean Science-Fiction magazine on the newsstands. Yours for progress and less criticism from your readers.

FRED AUGER,
3151 Eton Ave.,
Berkeley, Calif.

(We certainly appreciate what you say about the November issue of AMAZING STORIES and the authors you name will be greatly pleased by your commendation. You will soon have another story by Dr. Keller. He gives a very distinctive touch to all he writes and sometimes his endings are very striking and unanticipated, and we may say somewhat in the style of the famous O. Henry. We do not object to criticism from our readers. The Editor sits at his desk to receive scoldings. —EDITOR.)

The "Reprint" Question—The Cover—The Format or Size of the Magazine—A Good Wish at the End

Editor, AMAZING STORIES:

To begin this letter I have a few criticisms to make. In the first place why, oh, why, don't you reprint some of your wonderful stories of five and six years ago? For instance, "The Skylark of Space" and "The Moon Pool," also many others. Sigmund is a great artist but doesn't he have any bright colors in his paint box? I, for one, would enjoy a bright cover on your magazine. One more very bad kick, dear Editor: why did you change the size of AMAZING STORIES? In its new size it looks like a "cheap dime novel."

I forget some of your stories of five and six years ago, but it seems to me that your magazine declined in the quality of stories. However, it is rapidly regaining the leadership of science fiction magazines. Your articles (don't blush, Editor) are very educational facts of science. Referring to those in the front of AMAZING STORIES. In all, AMAZING STORIES is one grand magazine and here is one reader who appreciates your efforts for better stories

and a better magazine. Wishing you luck,

PAUL E. GROGER,
1404 26TH St.,
Ogden, Utah.

(It is much pleasanter to be told that our magazine is on the upward path rather than to have the gloomy assertion that it is going down. Personally we feel that it is pursuing a rather level course. A number of very good authors are staying with us, so that in a sense we feel that they are part of our staff. While we say that we are pursuing a level course, it is very gratifying to have some one write to us to say that we are on the up-grade. AMAZING STORIES is really a very big part of our life. Personally, the writer of the Editorials has to thank you for the words of appreciation you have bestowed upon them. The format, or size of the magazine is a distinct advance.—EDITOR.)

A Fine Tribute to the November AMAZING STORIES—Suggestion for Sub-titles

Editor, AMAZING STORIES:

I have just finished the November issue of "our" magazine and would like to tell you just how fine the stories are:

"Battery of Hate"—Superb.
"Whisper of Death"—Wonderful.
"Short Stories"—All Great.

"The Price of Peace"—Very Good.

These stories are very outstanding and also the other stories deserve all the credit due them.

Now for a few suggestions: have smooth edges. It would make it look much neater (the way it is makes it look like a "teh-center"). After all we are paying a quarter for it.

Resume the better grade of advertisements you had on the back cover of the last issue.

Cut out the sex advertisements. Have more pictures per issue. Never change Morey. He is the best of the three Science-Fiction illustrators. (He is good, all except the eyes of the characters he draws.)

Now for the real reason for this letter: as this is a scientific magazine, why not have a sub-title denoting the scientific substance of the story. For instance:

"The Theft of the Washington Monument"
"Time Traveling."

Do you understand my idea? Please print this letter to see what others think of it. I would welcome letters from other readers on this point.

J. H. HENNIGAR,
East Tawas, Michigan.

(We will take into consideration all that you say. You certainly make a selection of very good stories for your kind commendations. We have so many good stories on hand that we hesitate to increase the number of pictures as we wish to give plenty of literature. We

This is a place
holder for the back
cover.

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